

Published every Saturday by the Simmons-Boardman Publishing Company, 34 North Crystal Street, East Stroudsburg, Pa., with executive offices at 30 Church Street, New York.

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The Railway Age is a member of the Associated Business Papers (A. B. P.) and of the Audit Bureau of Circulations (A. B. C.)

Subscriptions, including 52 regular weekly issues and special daily editions published from time to time in New York, or in places other than New York, payable in advance and postage free; United States, Mexico and Canada, \$6.00. Foreign countries, not including daily editions \$8.00

Subscriptions for the fourth issue each month only (published in two sections, the second of which is the Motor Transport Section) payable in advance and postage free; United States, Mexico and Canada, \$1.00; foreign countries, \$2.00. Single copies, 25 cents each.

# Railway Age

With which are incorporated the Railway Review, the Railroad Gazette and the Railway Age-Gazette. Name Registered U. S. Patent Office.

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No. 17

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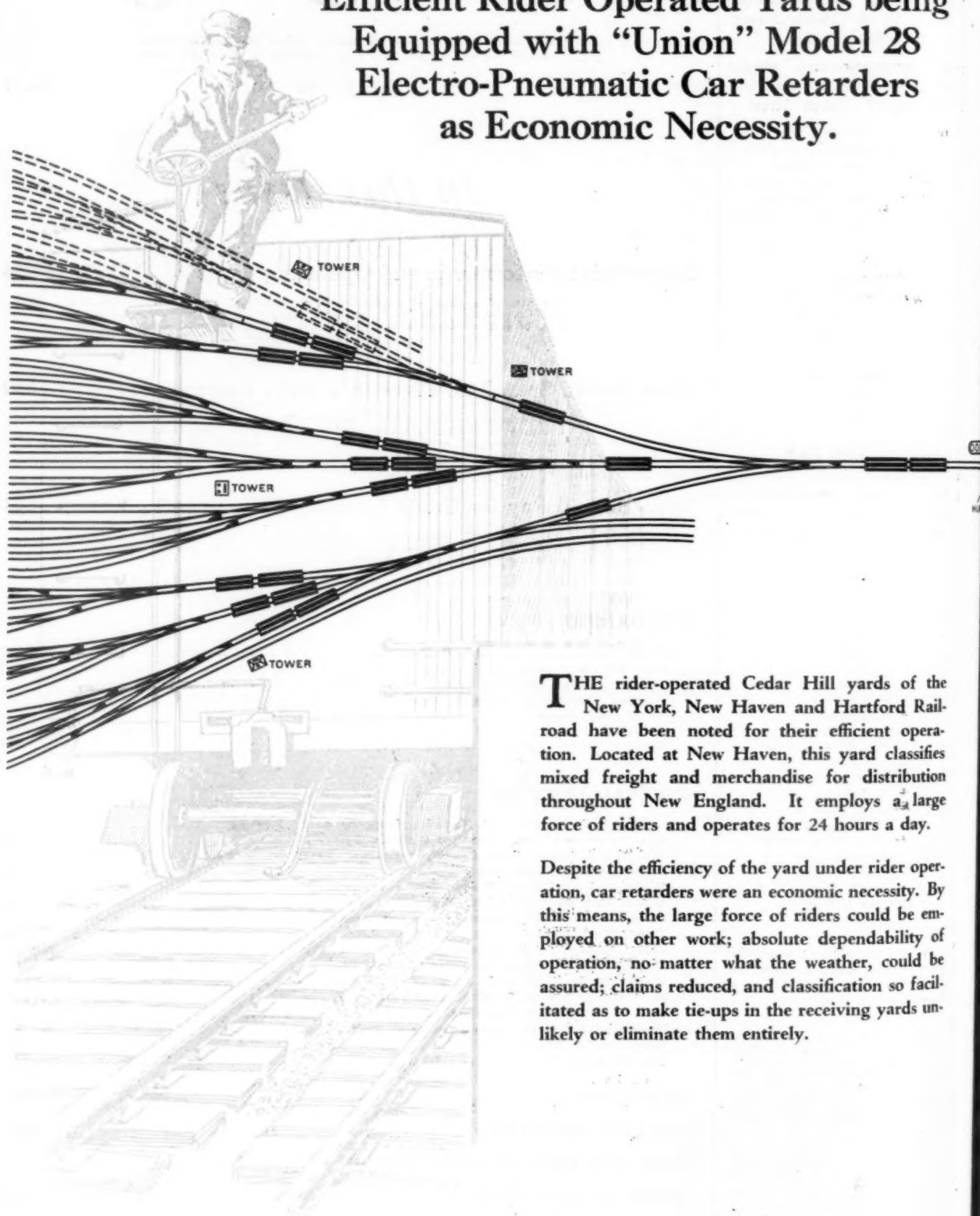
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# Modernizing Cedar Hill Yards

Efficient Rider Operated Yards being Equipped with "Union" Model 28 Electro-Pneumatic Car Retarders as Economic Necessity.



**T**HE rider-operated Cedar Hill yards of the New York, New Haven and Hartford Railroad have been noted for their efficient operation. Located at New Haven, this yard classifies mixed freight and merchandise for distribution throughout New England. It employs a large force of riders and operates for 24 hours a day.

Despite the efficiency of the yard under rider operation, car retarders were an economic necessity. By this means, the large force of riders could be employed on other work; absolute dependability of operation, no matter what the weather, could be assured; claims reduced, and classification so facilitated as to make tie-ups in the receiving yards unlikely or eliminate them entirely.

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# Railway Age

Vol. 86, No. 17

April 27, 1929

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## Costly Procrastination on Joint Facilities

**A**BOUT twenty years ago the operating and signal officers of the three railroads interested in a proposed interlocking at a grade crossing met to decide upon the type of construction, units of ownership and division of operating and maintenance expenses. These questions were not settled at this or subsequent meetings and as yet no plant has been installed at this crossing. In the intervening years, the signal officers present at the meeting 20 years ago have passed on and other men have taken up their work. During all of these years, the trains on these three roads have, according to the state law, stopped and whistled as a safety measure when using this crossing. Based on present-day traffic, an interlocking at this location would eliminate about 22,729 passenger-train stops and over 60,000 freight-train stops annually. It would pay about 60 per cent on the investment, and further delay in agreeing on the details in connection with the proposed plant results in a net loss of over \$10,500 each month. There are unquestionably good reasons why it is difficult to establish an agreement that would be satisfactory for all of the parties involved, but the failure to reach an understanding has resulted in losses far greater than those which might be presumed to accrue from real or imagined inequities in the various allocations of expenses that have been proposed from time to time. If this were but an isolated case, there would be no occasion to mention it here, but at least three other important layouts can be cited where efforts to install interlocking have been delayed for the same reason. In the meantime, the railroads involved are denied the economies and improvements in train operation which would result from the installation of modern interlockings.

## Law Observance Here and in Great Britain

**E**LSEWHERE in this issue appears the announcement that the Railway Rates Tribunal of Great Britain plans, on May 6, to open its review of railway rates in that country in accordance with the provisions of the Railways Act, 1921. This latter provided for the establishment of a standard revenue for each of the four amalgamated British railway companies. The Railway Rates Tribunal thus received a mandate to determine such standard revenues and so adjust rates that the standard returns would be realized. If this objective remained unrealized after the first full year during which the determined schedules of standard rates were in effect, the duty of revising these standard rates was to fall upon the tribunal. The standard revenues were accordingly prescribed after five years of study and the

standard rates designed to produce such revenues became effective January 1, 1928. During 1928, however, these latter failed by more than £9,000,000 or \$44,115,600; to produce the combined standard net revenue for the four companies. Hence, in accordance with the provisions of the act, the Railway Rates Tribunal is preparing to carry out its mandate to revise the tariff schedules. Analogous to the foregoing is the mandate to the Interstate Commerce Commission, as set forth in the Transportation Act of 1920, requiring that: "In the exercise of its power to prescribe just and reasonable rates the Commission shall initiate, modify, establish or adjust such rates so that carriers as a whole . . . will under honest, efficient and economical management . . . earn an aggregate annual net railway operating income equal, as near as may be, to a fair return upon the aggregate value of railway property of such carriers . . ." This enactment has been in force for nine years and in none of them have the rates prescribed by the Commission been such as to provide a return established by the Commission itself as fair.

## "Creosoted Wood" Must Be Treated With Creosote

**A**JUDGMENT of \$91,962 in favor of the owners of a pier at Pacific Beach, Cal., awarded by the Superior Court of Los Angeles county, might appear to be of remote interest to readers of the *Railway Age*, yet it is judged by the leaders of the wood-preserving industry to be of utmost value to all reputable concerns in that field, as well as to the users of treated wood. The pier, which was built over Teredo infested waters, was supported on piles purchased under a contract calling for treatment with creosote, but within less than two years the owners discovered definite evidence that the piles were being attacked by marine borers. When analyses of oil extracted from some of the piles showed that it consisted largely of a product known as cresoil, a mixture of 90 per cent petroleum oil and 10 per cent cresylic acid, they brought suit against the firm which had supplied the piling. In the trial, witnesses for the defense testified that creosoted piling meant "piling treated with a preservative," and an attempt was made to convince the court that since cresylic acid present in cresoil in some quantity is a coal tar derivative, and since creosote is also a coal tar derivative, cresoil is creosote and is so considered in the timber-preserving industry. However, several recognized authorities on wood preservation, who appeared as witnesses for the plaintiff, so completely refuted the evidence for the defense that the court decided in favor of the plaintiff. Trade practices, recognized by the railroads and those from whom they purchase treated wood, are so thoroughly established that there is little likelihood of fraud,

but it is exceedingly fortunate that the loose and misleading interpretation of the term "creosoted" offered in this case was not permitted to prevail. In fact, the decision definitely strengthens the position of those who sell and those who desire to buy wood treated with preservatives of recognized merit.

## Changing Character of Operating Divisions

**I**T is not so many years since an operating division on any railway was an exceedingly closely knit organization, sufficient unto itself. To the men in the ranks, the division superintendent was the final representative of authority. General superintendents came over the line occasionally, general managers on rarer occasions; but they did not come into intimate contact with the men; while the vice-president in charge of operations was almost a mythical figure to them. The division was the thing that counted. Men from other divisions were practically strangers, and the operations of other divisions were equally strange.

This system of operation presented certain advantages. Under a capable and popular superintendent, a truly magnificent esprit de corps was frequently observable, and often the division, viewed simply as a division, and nothing more, was efficiently operated in accordance with the standards then prevailing. However, the disadvantages far outweighed the advantages and, under modern conditions, the operation of each division as an entirely separate unit is doomed.

The importance of a system plan of operations is becoming more apparent daily. Such operating improvements as maintracking and long locomotive runs, for example, depend almost entirely for their success upon co-operation between divisions. One of the first steps to bring about a change was the practice of holding system-wide superintendents' meetings, where these officers could meet and talk over their various mutual problems. Some roads took advantage of such meetings to acquaint the superintendents with their railroad, by holding them at various division headquarters in turn, instead of at the general offices. The manifest benefits of these meetings have caused their extension far beyond the original idea of their limits. On nearly every railroad practically every department now holds such "get-together" meetings, not casually or in accordance with the expediency of the moment, but in accordance with a definite plan, which might be described, in terms of salesmanship, as making the supervisory officers "system-conscious," instead of only "divisions-conscious," as heretofore.

In breaking down the bars of "divisionalism," however, there is one fact that should not be lost sight of, namely, that the old system did foster divisional spirit and enterprise. True, this spirit, when unaccompanied by co-operation, often had the effect of turning the railway into a series of armed camps, representing the divisions. With the present free intercourse and co-operation between all divisions and all departments of those divisions, this inter-divisional enmity is being turned into friendly rivalry on many railways, with excellent results.

On the Pennsylvania, for example, a monthly "five-item" report is prepared, using five of the most important operating factors as a yardstick. All divisions

on the system are ranked in accordance with the percentage of improvement shown, and the report is widely distributed throughout the system. The interest aroused among all concerned is remarkable, and indicative of a healthy spirit. Other roads have similar means of creating competition as between the divisions.

This changed attitude has permitted the accomplishment of many things that, for years, were deemed impossible, and deserves no little credit for the improved operating ratios. The operation of divisions as entirely separate and distinct units is a thing of the past, but, in changing operations from a divisional to a system plan, the advantages of the former plan should not be overlooked, and the divisional pride and spirit should be retained in the form of friendly rivalry.

## Barge Line Results

**T**HE American public is entitled to have the truth, the whole truth, and nothing but the truth regarding the government's "experiment" in owning and operating the barge line on the Mississippi river system. The whole truth should be given in the annual reports of the Inland Waterways Corporation, all the stock of which is owned by the federal government. The whole truth has never been told in these reports. The report for 1928, which has been issued recently, is replete with statements of alleged facts and fallacious reasoning which, taken as a whole, afford a remarkable example of misrepresentation. The people of the United States are really the stockholders of the Inland Waterways Corporation. Any private corporation which should issue to its stockholders a report so misleading could properly be subjected to very severe criticism.

On pages 22-24 of the report appears the report of the secretary-treasurer of the corporation to Major General T. Q. Ashburn, its chairman. "This office has been advised by the comptroller of the corporation," says the secretary-treasurer, "that the total savings to the public on tonnage transported by the Mississippi-Warrior service during 1928 were as follows", which statement is followed by figures indicating that "the total savings to the public" were \$2,702,200. Presumably these "savings" were due to the difference between the freight rates charged by the barge line and those that would have been charged by the railways for the transportation of the same freight, although no details are given regarding the differences in rates which make it practicable to determine whether the savings claimed were actually made. On pages 16 and 17 of General Ashburn's report appears a reply to "Criticism of the Corporation's Methods of Reporting Results". The principal criticism alluded to has been that the corporation's reports have not included, among other things, interest upon the capital that has been invested by the government in the barge line. The reply made is, in substance, that the corporation reports its results in the same way as a railway corporation. All its stock is owned by the government. "So far as concerns the common stock no railroad charges itself up with a fixed charge upon the common stock", and neither does the Inland Waterways Corporation, "because", says General Ashburn, "there are no bonds outstanding." The fallaciousness of this reasoning is so palpable that it would be ridiculous if its tendency to mislead the pub-



lic were not so serious. It is true that "there are no bonds outstanding" against the Inland Waterways Corporation, but the government of the United States, which owns the stock of the corporation, has billions of dollars in bonds outstanding, and these include bonds representing the very investment the government has made in the stock of the Inland Waterways Corporation. Upon these bonds the public does pay interest. How much does it pay on them? The report of the Inland Waterways Corporation indicates that the investment last year in its facilities was about \$17,000,000, but General Ashburn, in his testimony before the House Committee on Interstate and Foreign Commerce a year ago, in reply to the question, "How much money has the government put into this proposition up to this time?" replied, "Taking the war-time prices, with all of the appropriations that have been made and the capital stock, it is in the neighborhood of \$24,000,000 to \$25,000,000". Therefore, at the rate of 4 per cent, the public is now paying about \$1,000,000 interest annually upon the government's investment in the property of the Inland Waterways Corporation. It is significant as to the way in which the government does business that it is impossible, from any official report, to determine just how much the interest upon its investment in the barge line actually is, but, whatever may be the amount, it is plain that upon every sound principle of economics and accounting it should be deducted from the so-called "savings to the public" on traffic transported by the barge line.

The advocates and defenders of the government's "experiment" constantly repeat that its purpose is to demonstrate the feasibility of private ownership and operation of common carriers on our inland waterways, and they claim that, from this standpoint, results show that it is proving a success. On page one of the report appears the statement that the barge line "closes the fiscal year of 1928 with a net income from operations of \$373,700". In the report of the secretary-treasurer, however, which appears in the same pamphlet, deductions are made for the expenses of the Washington office and other costs, as a result of which there is arrived at a "net profit for the year" of \$257,776. There is a difference between the two figures or more than 30 per cent. The reader may take the one which he prefers as representing the net return earned upon the government's investment in the barge line. Applying them to the investment, the minimum estimate of which appears to be \$17,000,000 and the maximum \$25,000,000, it is found that the net return earned was somewhere between 1 per cent and 2.2 per cent. This would hardly be attractive to private capital. Furthermore a private corporation would have to pay taxes upon its property, while the government does not. The annual taxes of the railways amount to six per cent of their total earnings. On this basis the barge line's taxes last year would have been \$416,000, and then it would have had less than no "net income" or "net profit for the year" at all to report. In fact, figuring taxes at six per cent of its total earnings and interest on its investment at four per cent, it had an actual deficit exceeding \$1,000,000. It may be said that the "savings" in freight rates of \$2,700,000 more than compensated for this. That is no answer to the conclusive evidence that no private corporation could operate the barge line at its present rates without heavy losses. Furthermore, the "savings" in rates made by the barge line are largely offset by the slower speed and general inferiority of its service as compared with that of the railways. This is demonstrated by the fact that if it tried to charge the same

rates as the railways it would soon lose all its traffic.

When the inferiority of the barge line's service, the interest paid by the government upon the capital invested in its facilities, the taxes that would have to be paid on its property and the return that would have to be earned by a private corporation, and all other pertinent facts are considered the "total savings to the public" claimed as a result of its operations are found to be fictitious. No business man would accept such figures and reasoning as appear in its report as indicating satisfactory conditions, results and tendencies in his own business. But business men who are enthusiasts for inland water transportation will accept them without study and broadcast them as proof of the advantages of inland water transportation and of the desirability of extending it. In considering the subject of inland water transportation most business men seem suddenly to forget all they ever knew regarding accounting, economic principles and efficient business methods.

## Railroad Competition

**I**N 1928 all the large classes of operating expenses of the Class I roads declined excepting the traffic expenses, which increased from \$120,350,000 to more than \$125,000,000. There has been a tendency for some years for traffic expenses to increase more in proportion than other operating expenses, or to increase when other expenses have declined. From 1923 to 1928 total operating expenses declined 9½ per cent, while traffic expenses increased 33 per cent. In 1928 total operating expenses were 56 per cent greater than in 1917, the last year preceding government operation, while traffic expenses were 92 per cent greater.

Traffic expenses include some expenses which are not strictly costs of developing traffic and selling service. For example, they include the expenses of the various traffic associations, which are maintained cooperatively, and the expenses of which, while double what they were before government control, are actually less than they were under government control in 1919. Most traffic expenses, however, are selling expenses, and the fact that they have increased one-third during the last five years, while total operating expenses have declined, illustrates the increase that has occurred within recent years in the cost of selling railway service. It is especially notable that the increase since 1923 has occurred during a period when not only have total operating expenses been reduced, but when there has been made the greatest improvement in railway service ever effected in any equal period in history.

This upward trend of selling expenses does not warrant any criticism of railway management. It has been due to some conditions such as have caused relatively much larger increases in selling expenses in other industries, and to some which have been peculiar to the railroad industry. The productive capacity of the railroads, like that of some other industries, has increased faster within recent years than the effective demand for their products, and they have increased their sales efforts to stimulate demand. The railways, like some other industries, also have been subjected to new forms of competition. The necessity of meeting new and increased competition by highway and waterway has no doubt influenced selling expenses. It seems probable that present and prospective conditions warrant a con-



tinuing increase rather than a reduction in expenditures for the sale of railway freight and passenger service.

### *Significance of Traffic Expenses*

The relatively large increase in traffic expenses is important and significant, not because of the amount of money involved, but because of tendencies which it reflects. It is undoubtedly due mainly to competition between the railroads themselves. If traffic expenses represented fully the cost of this competition it would be a comparatively trifling matter. Everybody familiar with railway affairs knows, however, that the railways are now competing for freight business with an almost unprecedented energy; that this is affecting their earnings and operating expenses in numerous ways, and that it may affect them still more.

The statement is often made and quite generally accepted that regulation has abolished competition in railway rates, and complaints are quite often made by spokesmen of the railways that the Interstate Commerce Commission does not make rates high enough. The fact is that there is constant competition in rate making between the railways which results in numerous downward "readjustments," and which frequently threatens to cause, or actually does cause, substantial reduction in revenues. For example, the earnings of the railways from grain traffic are important. For years shippers have been before the commission seeking, and the railways have been before it opposing, reductions in grain rates. Repeatedly during this time the complicated and delicately adjusted grain rate structure, and the earnings derived from grain traffic, have been seriously threatened by railroad competition, and this is actually the situation at the present time.

It is principally due to the competition between the railroads for traffic that the use of purchases to influence traffic and of traffic to influence purchases has become so prevalent. The trading of purchases for traffic began in a natural way and on a small scale. As long as it was confined to the railways and concerns directly engaged in the manufacture of railway equipment and devices it was of no substantial consequence. Within recent years however, it has been discovered that it is a practice which can be so used by big shippers as to get for them advantages similar to those formerly derived by them from discriminations in service and rates. Almost every railway now has surplus capacity and is hungry for traffic. Every railway has to compete with other railways that are equally hungry for traffic. This gives the big shipper a power that he did not possess during the period when most railways had inadequate capacity. Fear as to how the big shipper will route his traffic over the various lines that are competing for it is influencing purchases in an increasing number of cases. If a railway buys equipment or materials because of traffic considerations from a company from which it would not buy them excepting for traffic considerations, the effects upon its capital and operating costs must be adverse, regardless of what may be the effect upon its total earnings.

Competition for traffic has also caused and is still causing many increases in service of various kinds and, also, much speeding up of train service, both passenger and freight.

There are some persons who favor railroad monopoly under government ownership. There have been some who have favored railroad monopoly through the ownership of all the railroads of the country by a single private company. There are some who believe that the successful management of all our railroads as a single

system, whether under public or private ownership, would be impracticable, but that the combination of all the railroads in each large region would be desirable. Of course, those who hold any of these views believe that the disadvantages of railroad competition exceed its advantages. This opinion, however, is not generally accepted by railway officers, shippers or the public. It is the opinion of most railway officers, shippers and public men that a reasonable amount of competition between railroads tends to cause improvements in service, reductions in operating expenses and the lowest rates consistent with good service. The policy of the consolidation provisions of the Transportation Act is to preserve competition in every territory, and no spokesmen of the railways or of important business interests has questioned the soundness of this general policy.

### *What is Reasonable Competition?*

Just what is a reasonable amount of competition between railroads is, however, an important unsettled question. What competitive practices are justifiable, and what are not? It has been generally accepted as economically unsound, and has been made a violation of law for a railway, for competitive reasons, to give a shipper special advantages in service or rates. Is it reasonable and desirable competition for a railway, in an effort to get more traffic for itself, to make independently a reduction in rates which other roads will feel they must meet and which will therefore result in reduction of the net operating income of an entire group of roads which already is earning less than a fair return? Is it reasonable and desirable competition for a railway, mainly in order to get or avoid losing the traffic of a big industrial concern, to make purchases from this concern or some subsidiary company, and thereby render it necessary for competing lines to make purchases from the same company or risk the loss of the traffic that it represents? How much consideration should the management of an individual railway give, in carrying on its competitive activities, to the effect that what it does probably will have upon other lines in its territory, and upon the rates, operating expenses and financial results of the entire railroad industry?

Any form of competitive activity which, if adopted by all the railways, would be harmful to the railroad industry as a whole, is one which it is unreasonable and undesirable for any railway to engage in. Any form of competitive activity which tends to reduce the net operating income of any group of roads or of the railways as a whole, when they are already not earning a fair return, is contrary to the interests of the industry. There may be some exceptions to the principles here stated, but they must be few and unimportant. Any competitive practice which tends unnecessarily to reduce the total earnings or increase the total operating expenses of the industry is one which tends to reduce its net operating income, and therefore, upon the principle stated, is indefensible.

Now, of course, very few persons in railroad service are employed by the industry as a whole. The allegiance of a vast majority of them is to individual lines, and they are quick to defend anything done by their own managements to promote the interest of the properties with which they are connected. It is significant, however, that those who are so quick to defend certain kinds of competitive practices when indulged in by their own companies usually are equally quick to criticize similar practices when adopted by competing railways. The usual ground of criticism is

that when such practices are adopted by some railways, competition will force many or all railways to adopt them, and that in the long run all railways will lose by them. Why is it that so many railway officers can foresee so clearly the probable harmful effects of an act of a competing line, and are so blind to the similar probable effects of a similar competitive move of their own line?

It would be asking too much of human nature to ask that officers of individual lines subordinate the welfare of their own railways to the welfare of the railroad industry. But would it be expecting too much to expect that they would give as much consideration to the welfare of the railroad industry as they ask Congress, the Interstate Commerce Commission and the public to give it? They ask Congress, the Interstate Commerce Commission and the public not to force groups of railways or the railways as a whole to make unnecessary reductions in their rates or increases in their operating expenses when they already are not on the average, earning a fair return. They cannot consistently ask this of Congress, the commission and the public, and at the same time justify competitive practices that tend to have the same effects as the policies of regulation against which they protest.

## When a Loss Is a Profit

THE railways within recent years, have made remarkable progress in the reduction of operating expenses. It goes without saying that the managements of all the railways are interested in means of still further reducing the expenses incurred in carrying on their business, particularly in the provision of those services which are necessary but which in recent years have failed by a steadily widening margin to pay their own way. With the advent and increasing use of the private automobile, the local passenger service of the railways, particularly on branch lines, has fallen into this category. It is to be doubted if very many branch-line passenger trains are at present bringing in enough revenue to pay the out-of-pocket expenses of their operation. Means of reducing the cost of providing necessary branch line service, therefore, are worthy of the careful, unbiased consideration of railway managements.

What means have been adopted by the railways to reduce the cost of providing local passenger service, especially on branch lines? In a few instances, unprofitable passenger train service has been abandoned without the substitution of any other form of service, but under current regulation this has been found a difficult way out of a bad situation. As a rule, the railways have been expected and required to continue to furnish some sort of passenger transportation in all parts of their territories, regardless of the losses incurred. Somewhat greater success has attended the efforts of some railways to substitute mixed-train service where the passenger service losses have been great. In many instances, rail motor cars have been substituted for passenger trains, with good effect in reducing operating expenses. The latest and now rather widely adopted means of reducing the cost of providing passenger service is the substitution of motor coach service for train service.

From many standpoints, the motor coach has much to offer to the steam railways. Certainly it has more to offer to them than to the independent operator. If the

independent operator is to continue in business, he must put his motor coaches on those routes, the potential traffic of which is sufficient to promise revenues exceeding his expenses. The steam railway, on the other hand, need not be so concerned about the earning power of the motor coach itself, if it can eliminate a more expensive passenger-train schedule for each motor coach schedule established. This fact offers the greatest of possibilities for motor coach operation by railways.

It was stated by an officer of the Boston & Maine several months ago that the motor coaches operated by the Boston & Maine Transportation Company have replaced 200,000 passenger-train miles or rail motor-car miles annually, thereby reducing the cost of operation of the railway more than \$250,000 a year. Disregarding the fact that the Boston & Maine Transportation Company's motor coaches have been virtually self-supporting, it will readily be seen what motor coach operation has meant to the Boston & Maine, when it is considered that the operation of these motor coaches has permitted the taking off of trains costing five times as much to operate.

An interesting case has recently developed in one of the southeastern states. A short line subsidiary of a large railway system operating two passenger trains in each direction daily over a 40-mile line, suffered a decline in passenger revenues from \$65,938 in 1920 to \$8,668 in 1927. Estimated passenger revenues in 1928 were \$4,130, or a decrease of 94 per cent as compared with 1920. Other passenger train revenues in 1927 were \$10,155, and were estimated at \$8,820 in 1928. The expenses of providing passenger train service were approximately \$37,400 in 1927. This short line organized a subsidiary in December, 1928, to operate motor coaches, and took over the line of an independent operator, who, on account of the small amount of traffic available, had been unable to make the operation pay its expenses. The superintendent of the railway estimates that the operating revenues of his motor coaches this year will exceed his operating expenses by \$700. A rail motor car is being used to handle mail and express, and a net loss of some \$2,000 or \$3,000 is expected on this; but even on this basis, the railway will be approximately \$24,000 ahead, as compared with 1928, due to the elimination of the heavy passenger service losses through the substitution of inexpensive motor coaches for expensive passenger trains.

Similar substitutions of motor coaches for trains are being made by railways all over the country. As yet, the surface has hardly more than been scratched, except in a few cases, but substantial progress is now being made. Motor coach operation in substitution for steam train operation appears to be a most promising source of reduction in the cost of providing necessary transportation service. The regulatory commissions, as a rule, have been much more receptive to requests of the railways to take off unprofitable train service, when such requests have been accompanied by proposals to substitute similar service on the highways under railway management, than when they have not been so accompanied. In view of this situation, good transportation practice would seem now to indicate the desirability of replacing, wherever possible, the railways' many expensive, unremunerative local passenger trains. Whether or not the inexpensive substitute will pay its own way is not so important. The fact that it will enable substantial savings in the operating expenses of the railway is most important. In such cases, even an apparent "loss" may be a "profit."



# Locomotive Performance and Operating Costs

*A study of the interrelation of tonnage, rate of fuel consumption and speed, and their effect on expenses*

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## Part I

THE determination of the most economical operating conditions for the steam locomotive involves so many factors that it seems almost impossible to obtain all the data required for a complete and accurate solution of the problem. For that reason it is not surprising that little information based on definite operating performance is available to guide railroad

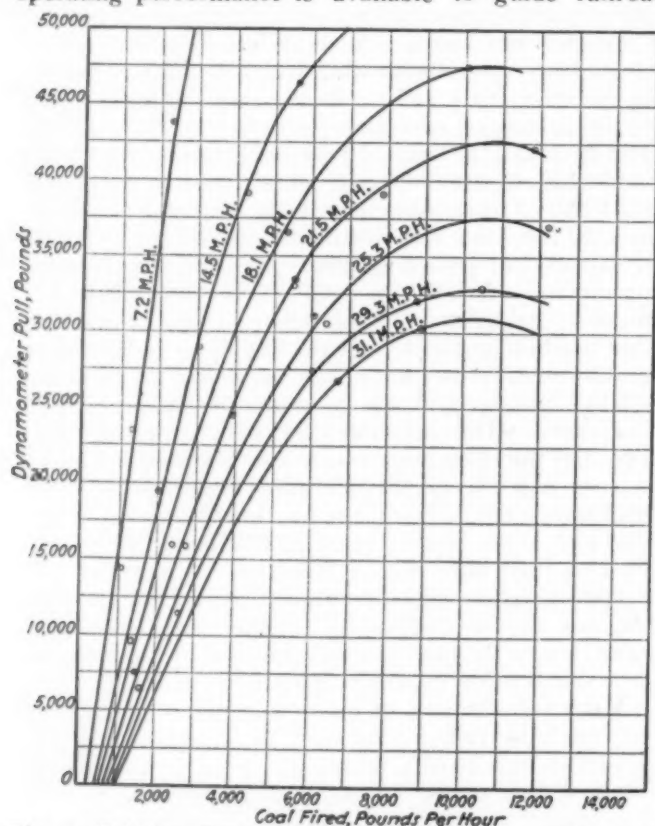


Fig. 1—Relation Between Rate of Fuel Consumption and Tractive Force at Constant Speed

officers in selecting the train loads and speeds that will give the desired results in securing either minimum costs or maximum movement of traffic.

Formerly in the studies of this subject attention was focused on minimum wage costs, but in the past few years more effort has been directed toward getting the maximum ton-miles per hour from each locomotive. Many people apparently believe that as the ton-miles per hour increase, the direct transportation cost must decrease. If wages are on the hourly basis this is true, provided the cost of fuel does not increase more than the cost of wages decreases. If the speed is such that wages are on a mileage basis fuel becomes the determining factor.

It is usual to assume that the tonnage determines the

train speed and the cost of operation, which is far from correct. With a given tonnage the speed depends on the power output, which, in turn, with any given locomotive and fuel of definite heating value, depends on the amount of fuel supplied. Therefore, any variation in the rate of firing would, except in special cases, change the unit cost of both fuel and wages on the ton-mile basis. This is illustrated, for example, by the difference in the tonnage hauled, the speed of movement and the cost of fuel and wages when using similar locomotives with and without stokers. It is evident, therefore, that the rate of firing, which is in a large measure independent of other variables, is an important factor in determining operating results and operating costs.

The data presented in this article have been prepared with the object of bringing out the interrelation of tonnage, rate of fuel consumption and speed, and their effect on various items of expense. Since the conditions under which road tests are conducted make it difficult to keep any set of conditions constant and determine the influence of each variable factor, the basic data regarding locomotive performance have been taken from test-plant results, suitable modifications being made to take care of the different conditions in road service.

In investigating the effect of tonnage, fuel consumption and speed, it is necessary to determine the varia-

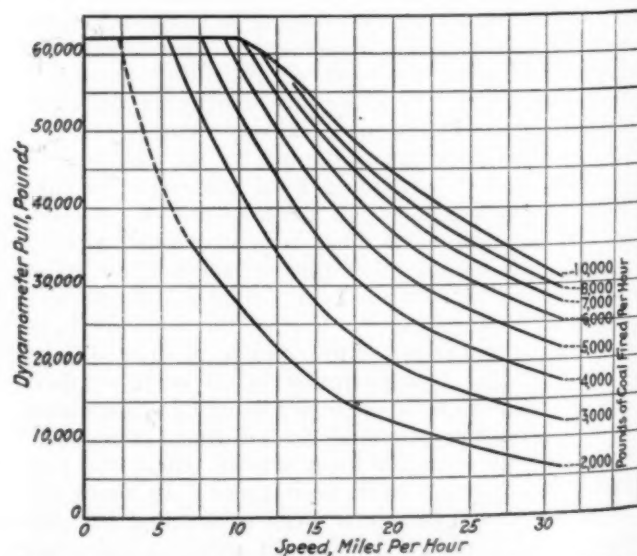


Fig. 2—Dynamometer-Pull-Speed Curves for Various Rates of Fuel Consumption

tion of drawbar pull over the usual range of speed at various fixed rates of fuel consumption. From locomotive test-plant trials of a typical locomotive, a diagram can be prepared showing for several speeds the variation



in tractive force from the minimum to the maximum rate of fuel consumption (Fig. 1). From the chart, curves showing the tractive force at varying speeds for given rates of firing can be derived. Such a set of dynamometer-pull-speed curves is shown in Fig. 2. These charts are plotted from the records of test-plant trials of the Pennsylvania Railroad Class L-1-S superheated Mikado type locomotive. The tests were made with a high grade bituminous coal having a heating value of about 14,000 B.t.u. per lb.

The principal dimensions of the locomotive are as follows:

Total weight of engine .....	315,600 lb.
Cylinders .....	27 in. by 30 in.
Diameter of driving wheels .....	62 in.
Boiler pressure .....	205 lb.
Evaporative heating surface .....	4,017 sq. ft.
Superheating surface .....	1,172 sq. ft.
Graze area .....	70 sq. ft.
Rated tractive force (85 per cent boiler pressure)....	61,460 lb.

The curves in Fig. 2, being taken from test plant results, do not show the true tender drawbar pull. Readings from these curves have, therefore, been corrected for head air resistance and the train resistance of the leading and trailing trucks and the tender. For the purpose of this analysis the tender has been assumed to be two-thirds full of coal and water, as representative of the average condition in service. The net tractive force or tender drawbar pull on straight level track is shown in Fig. 3.

This chart requires no comment except that attention should be called to the fact that at rates of firing in excess of 4,000 lb. per hour as the fuel supply is increased, each additional 1,000 lb. per hour produces a smaller increase in the drawbar pull. A few runs were made at about 12,000 lb. of coal an hour, but these have not been included in Figs. 2 and 3. The data obtained in these tests indicates that the capacity of the locomotive at that rate is actually less than at 10,000 lb. per hour. Stating it in a different way, when an attempt was made to burn more than about 150 lb. of coal per sq. ft. of

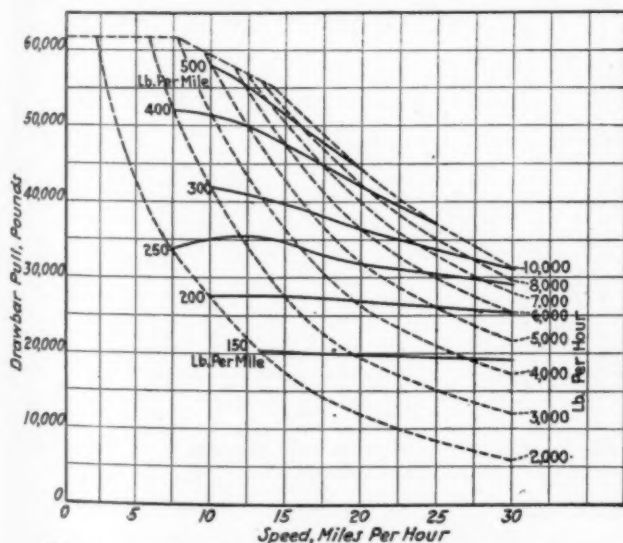


Fig. 3—Tender Drawbar Pull and Coal Per Mile

grate per hour, combustion was incomplete and no increase in capacity resulted. This is brought out by the downward trend of the curves in Fig. 1, beyond 10,000 lb. per hour.

A comparison of the drawbar pull at constant speed and varying rates of firing brings out interesting features. For instance, at 20 miles an hour, firing 2,000 lb. of coal per hour, the drawbar pull is 11,700 lb. At

3,000 lb. per hour, it is raised to 19,400 lb., an increase of 66 per cent in hauling power obtained with 50 per cent more fuel. From 3,000 lb. to 4,000 lb., 33 per cent increase in fuel produces 35 per cent more drawbar pull. From 4,000 to 5,000 lb., 25 per cent more fuel gives 21 per cent more drawbar pull. From 5,000 to 6,000 lb., the ratios are 20 per cent and 13.8 per cent. From 8,000

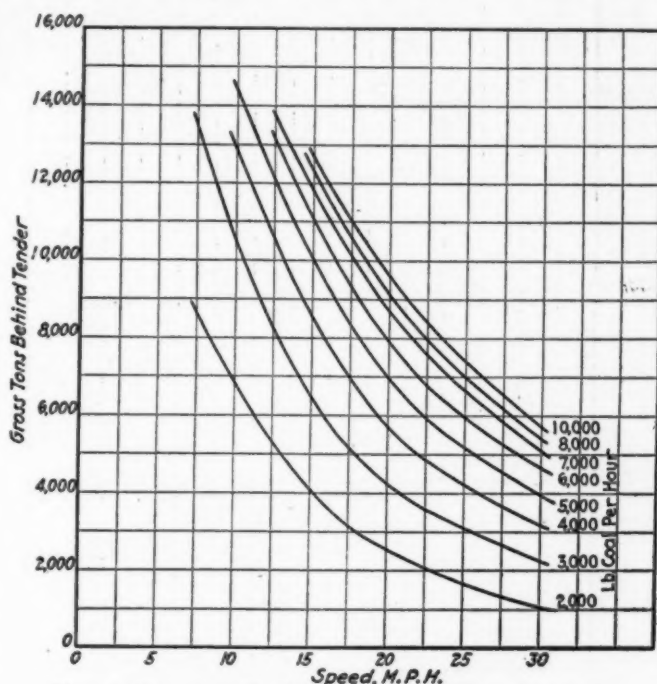


Fig. 4—Tonnage Hauled at Varying Rates of Firing

to 10,000 lb., 25 per cent more fuel gives only 5.5 per cent greater hauling capacity. This shows that the maximum efficiency of fuel utilization at this speed is at about 4,000 lb. per hour, and brings out the wastefulness of extremely high rates of firing.

From Fig. 3 an interesting set of curves can be derived to illustrate the variation in drawbar pull at varying speeds when the fuel consumption per mile is constant. Such curves are shown by the full lines in Fig. 3. If the efficiency of the locomotive was constant these lines would all be straight and horizontal. At and below 200 lb. of fuel per mile this appears approximately true. It is probably to be explained by an increase in steam temperature offsetting the decrease in boiler efficiency which takes place as the fuel fired per hour increases. At the higher rates, however, the tractive force produced by a given fuel consumption per mile decreases rapidly as the speed and fuel rate per hour increases.

Having determined the drawbar pull, the resistance of the train must be ascertained. The values for train resistance used in this analysis have been taken from Bulletin No. 43 of the University of Illinois\*, and are for a representative average condition based throughout on an average car weight of 50 tons gross, being as follows:

Table I—Train Resistance				
Speed, m.p.h. ....	7.5	10	15	20
Train resistance, lb. per ton....	3.85	4.0	4.2	4.6
				5.0
				5.5

The data presented in Figs. 1, 2 and 3 are shown in Table II, together with derived figures pertaining to tonnage, speed and fuel consumption at varying speeds with several rates of firing. Line 1 is obtained directly

\* Freight Train Resistance; Its Relation to Average Car Weight, by Edward C. Schmidt.

from Fig. 1. Line 2 is derived by subtracting from Line 1 the train resistance of the leading and trailing trucks and the tender. Line 3 is arrived at by dividing Line

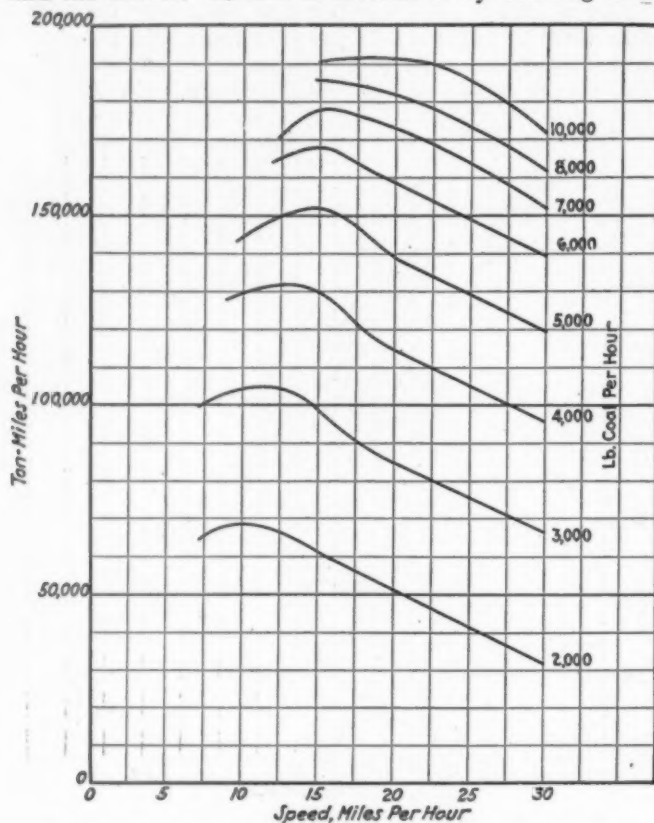


Fig. 5—Ton-Miles per Hour at Various Rates of Firing

2 by the train resistance as shown in Table I. Line 4 is the product of Line 3 multiplied by the speed in miles per hour. Line 5 is obtained by dividing the rate of firing by Line 4.

Table II—Tractive Force and Locomotive Performance

2,000 LB. OF COAL AN HOUR							
Line	Speed, m.p.h. ....	7.5	10	15	20	25	30
1	Dynamometer pull..	33,800	27,600	17,500	12,200	9,100	6,500
		344	362	406	496	583	704
2	Tender drawbar pull, level .....	33,436	27,238	17,094	11,704	8,517	5,796
3	Tonnage, 50-ton cars	8,680	6,810	4,070	2,540	1,700	1,050
4	Ton-miles per hour	65,100	68,100	61,000	50,800	42,500	31,500
5	Lb. coal per 1,000 ton-miles .....	30.7	29.4	32.8	39.4	47.1	63.5
3,000 LB. OF COAL AN HOUR							
Line	Speed, m.p.h. ....	7.5	10	15	20	25	30
1	Dynamometer pull..	52,300	42,200	28,000	19,900	15,800	12,800
		344	362	406	496	583	704
2	Tender drawbar pull, level .....	51,956	41,838	27,594	19,404	15,217	12,096
3	Tonnage, 50-ton cars	13,500	10,400	6,570	4,220	3,040	2,200
4	Ton-miles per hour	101,000	104,000	98,500	84,400	76,000	66,000
5	Lb. coal per 1,000 ton-miles .....	29.7	28.8	30.5	35.6	39.5	45.5
4,000 LB. OF COAL AN HOUR							
Line	Speed, m.p.h. ....	10	15	20	25	30	
1	Dynamometer pull .....	52,200	36,700	26,800	21,600	18,100	
		362	406	496	583	704	
2	Tender drawbar pull.....	51,838	36,294	26,300	21,017	17,396	
3	Tonnage, 50-ton cars.....	12,950	8,640	5,710	4,200	3,160	
4	Ton-miles per hour.....	129,500	129,800	114,200	105,000	95,000	
5	Lb. coal per 1,000 ton-miles.	30.9	30.8	35.0	38.1	42.2	
5,000 LB. OF COAL AN HOUR							
Line	Speed, m.p.h. ....	10	15	20	25	30	
1	Dynamometer pull .....	58,300	43,000	32,400	26,600	22,500	
		362	406	496	583	704	
2	Tender drawbar pull.....	57,938	42,594	31,904	26,013	21,796	
3	Tonnage, 50-ton cars.....	14,460	10,150	6,940	5,200	3,960	
4	Ton-miles per hour.....	144,600	152,000	138,800	130,000	119,000	
5	Lb. coal per 1,000 ton-miles.	34.6	32.9	36.0	38.5	42.0	
6,000 LB. OF COAL AN HOUR							
Line	Speed, m.p.h. ....	12.5	15	20	25	30	
1	Dynamometer pull .....	54,500	47,500	36,800	30,500	26,200	
		384	406	496	583	704	
2	Tender drawbar pull.....	54,116	47,094	36,304	29,917	25,496	

3	Tonnage, 50-ton cars	13,200	11,220	7,890	5,980	4,630
4	Ton-miles per hour	165,000	168,500	156,800	149,500	139,000
5	Lb. coal per 1,000 ton-miles	36.4	35.6	38.5	40.1	43.2

7,000 LB. OF COAL AN HOUR

Line	Speed, m.p.h.	12.5	15	20	25	30
1	Dynamometer pull	56,900	50,300	40,300	33,400	28,600
		384	406	496	583	704
2	Tender drawbar pull	56,516	49,894	39,804	32,817	27,896
3	Tonnage, 50-ton cars	13,700	11,880	8,650	6,560	5,070
4	Ton-miles per hour	171,000	178,000	173,000	164,000	152,000
5	Lb. coal per 1,000 ton-miles	41.0	39.3	40.5	42.7	46.0

8,000 LB. OF COAL AN HOUR

Line	Speed, m.p.h.	15	20	25	30
1	Dynamometer pull	52,300	42,300	35,600	30,400
		406	496	583	704
2	Tender drawbar pull	51,894	41,804	35,017	29,696
3	Tonnage, 50-ton cars	12,360	9,090	7,000	5,400
4	Ton-miles per hour	185,500	181,800	175,000	162,000
5	Lb. coal per 1,000 ton-miles	43.1	44.0	45.8	47.4

10,000 LB. OF COAL AN HOUR

Line	Speed, m.p.h.	15	20	25	30
1	Dynamometer pull	53,700	44,600	37,700	32,100
		406	496	583	704
2	Tender drawbar pull	53,294	44,104	37,117	31,396
3	Tonnage, 50-ton cars	12,700	9,580	7,420	5,710
4	Ton-miles per hour	190,500	191,600	183,400	171,000
5	Lb. coal per 1,000 ton-miles	52.5	52.2	53.9	58.5

It should be noted that the performance values shown in the table are not directly comparable with similar figures obtained under usual operating conditions as they are based on level, tangent track and do not take into account the effect of delays enroute, fuel consumed at terminals, etc. The effect of these factors will be discussed later.

The tonnage hauled at various speeds with given rates of fuel consumption is shown in Fig. 4. These curves are of the same general form as the lines of tender drawbar pull in Fig. 3, except that the downward slope as speed increases is more pronounced due to the increase in train resistance.

In Fig. 5 is shown graphically the locomotive output in ton-miles per hour as speed and rate of firing vary. An interesting feature of these curves is the well defined maximum for the different rates of fuel consumption

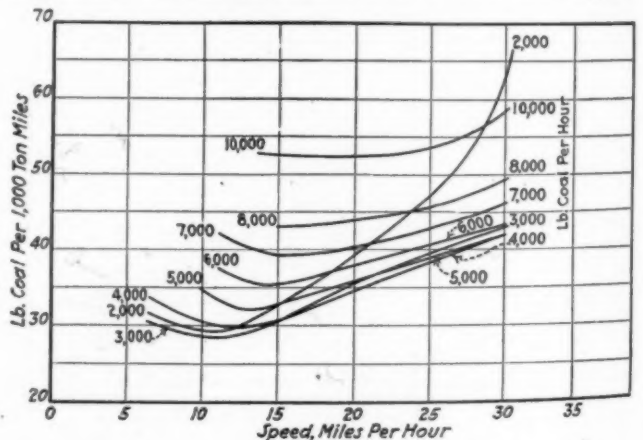


Fig. 6—Fuel Consumption per Thousand Ton-Miles at Various Rates of Firing

which occurs at about 10 m.p.h. for the lowest rate of firing, and increases progressively to about 18 m.p.h. at the rate which gives maximum power output

The fuel consumption on a ton-mile basis, as shown in Fig. 6, brings out clearly the economical fuel rates for various speeds. Considering first the lowest rate, 2,000 per hour, we find that at 7.5 m.p.h. and 10 m.p.h. it is close to the minimum, but as the speed increases the curve slopes upward more and more rapidly until at 30 m.p.h. it shows the highest consumption on the ton-mile basis recorded on the chart. This is to be explained by the large proportion of the power developed which is required to haul the locomotive and tender.



Increasing the fuel rate to 3,000 lb. per hour gives a still lower unit consumption at 7.5 m.p.h. and 10 m.p.h. The curve shows the characteristic upward trend at higher speeds and crosses the curve for 4,000 lb. an hour at about 15 m.p.h., but is not far above the minimum up to 30 m.p.h. The fuel rate of 4,000 lb. per hour gives the lowest consumption per ton-mile from 17 m.p.h. to 30 m.p.h., at which speed the unit consumption at 5,000 lb. per hour is almost the same as for 4,000 lb. per hour. As the rate of firing is increased still further the fuel per ton-mile increases throughout the entire range of speed, the difference between 8,000 and 10,000 lb. per hour being particularly large.

The same data are shown on a different basis by Fig. 7, in which each line represents a constant speed. The principal characteristics to be noted are the definite minimum values of fuel consumption, in every case, at a tonnage intermediate between the minimum and maximum, and the marked difference in the fuel rate which may be caused by a slight change in tonnage at the higher speeds.

Fig. 8, showing the unit fuel consumption at various speeds with constant tonnage, brings out clearly the interrelation of these factors. The line for 4,000 tons is the lowest at 30 m.p.h. and down to 24 m.p.h. From 24 m.p.h. to 20 m.p.h. the 5,000-ton train gives lower fuel consumption, and so on. The line for 12,000 tons is not well defined as only two points are located on it. However, the trend indicates that this loading would result in the lowest unit fuel consumption if the speed was below 7 m.p.h. It should be noted that for every speed there is a definite tonnage at which the unit fuel consumption for that speed reaches its minimum value.

### Combined Cost of Fuel and Wages

From the data shown in Table II, the cost of coal can readily be calculated, and by applying the standard wage rates for train crews the cost of wages can be obtained, based on continuous operation at the various speeds. Although this last assumption represents ideal operating

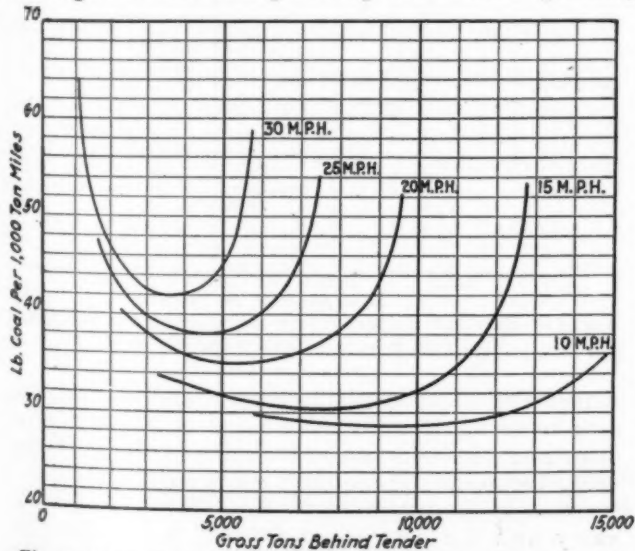


Fig. 7—Unit Coal Consumption at Various Speeds with Varying Tonnage

conditions which are never found in actual practice, it seems advisable for purposes of comparison to analyze this case before going on to the consideration of a typical example introducing the numerous other variable factors involved in the problems of economical train operation.

In calculating the cost of fuel it is necessary to assume a fixed unit price. This has been taken as \$2.60

a ton, which is fairly representative of the average cost of coal delivered on the tender for the country as a whole. The cost of wages has been figured by applying

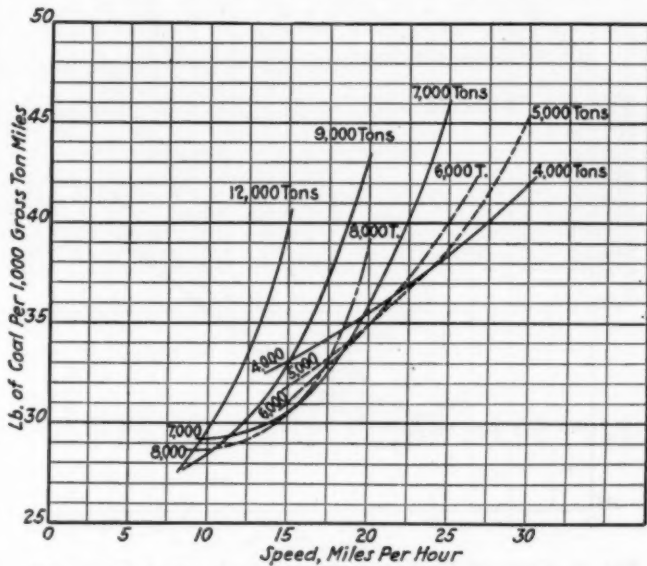


Fig. 8—Unit Fuel Consumption with Various Tonnages

standard rules and the rates of pay shown in Table IV, the rates for the engine crew being those applying for the weight on drivers of the locomotive in question.

Table III—Cost of Fuel and Wages per Thousand Ton-Miles (Continuous Operation)

Speed, m.p.h.....	7.5	10	15	20	25	30
	2,000	LB. OF COAL AN HOUR				
Coal .....	0.0399	0.0382	0.0427	0.0512	0.0613	0.0825
Wages .....	0.0587	0.0561	0.0751	0.1202	0.1800	0.2910
Coal and wages....	0.0986	0.0943	0.1178	0.1714	0.2413	0.3735
	3,000	LB. OF COAL AN HOUR				
Coal .....	0.0386	0.0375	0.0397	0.0463	0.0514	0.0592
Wages .....	0.0378	0.0367	0.0465	0.0725	0.1007	0.1390
Coal and wages....	0.0764	0.0742	0.0862	0.1188	0.1521	0.1982
	4,000	LB. OF COAL AN HOUR				
Coal .....	0.0402	0.0400	0.0455	0.0495	0.0549	0.0549
Wages .....	0.0295	0.0354	0.0535	0.0728	0.0968	0.1272
Coal and wages....	0.0697	0.0754	0.0990	0.1223	0.1517	0.1864
	5,000	LB. OF COAL AN HOUR				
Coal .....	0.0450	0.0428	0.0468	0.0500	0.0546	0.0592
Wages .....	0.0264	0.0301	0.0441	0.0588	0.0772	0.1072
Coal and wages....	0.0714	0.0729	0.0909	0.1088	0.1318	0.1664
Speed, m.p.h. ....	12.5	15	20	25	30	
	6,000	LB. OF COAL AN HOUR				
Coal .....	0.0473	0.0463	0.0500	0.0521	0.0561	
Wages .....	0.0232	0.0272	0.0387	0.0511	0.0660	
Coal and wages....	0.0705	0.0735	0.0887	0.1032	0.1221	
	7,000	LB. OF COAL AN HOUR				
Coal .....	0.0533	0.0511	0.0527	0.0555	0.0598	
Wages .....	0.0223	0.0258	0.0354	0.0466	0.0603	
Coal and wages....	0.0756	0.0769	0.0881	0.1021	0.1201	
	8,000	LB. OF COAL AN HOUR				
Coal .....	0.0560	0.0572	0.0595	0.0642	0.0692	
Wages .....	0.0248	0.0336	0.0437	0.0566	0.0728	
Coal and wages....	0.0808	0.0908	0.1032	0.1208	0.1420	
	10,000	LB. OF COAL AN HOUR				
Coal .....	0.0683	0.0679	0.0701	0.0760	0.0820	
Wages .....	0.0241	0.0320	0.0412	0.0535	0.0680	
Coal and wages....	0.0924	0.0999	0.1113	0.1295	0.1500	
Cost of coal assumed at \$2.60 per ton on the tender. Wages based on typical eastern schedule, rates being as follows: Engineers \$8.13, firemen \$5.42, conductors \$6.62, and brakemen \$5.20.						

Cost of coal assumed at \$2.60 per ton on the tender. Wages based on typical eastern schedule, rates being as follows: Engineers \$8.13, firemen \$5.42, conductors \$6.62, and brakemen \$5.20.

The train crew is assumed to comprise one engineer, one fireman, one conductor and two brakemen.

The wage cost has been calculated on the hourly basis for speeds up to and including 12½ miles an hour and on the mileage basis for higher speeds.

Wage rates do not vary greatly; on the other hand, fuel costs in different sections of the country are in some places lower and in other localities considerably higher than the assumed average price. It should be understood that the tables and charts presented in this article are not representative of all conditions. The relations shown and the conclusions drawn therefrom may be altered by a change in the ratio between wage rates and fuel costs. Where the ratio of fuel cost to wage cost is higher, conditions which result in the lowest



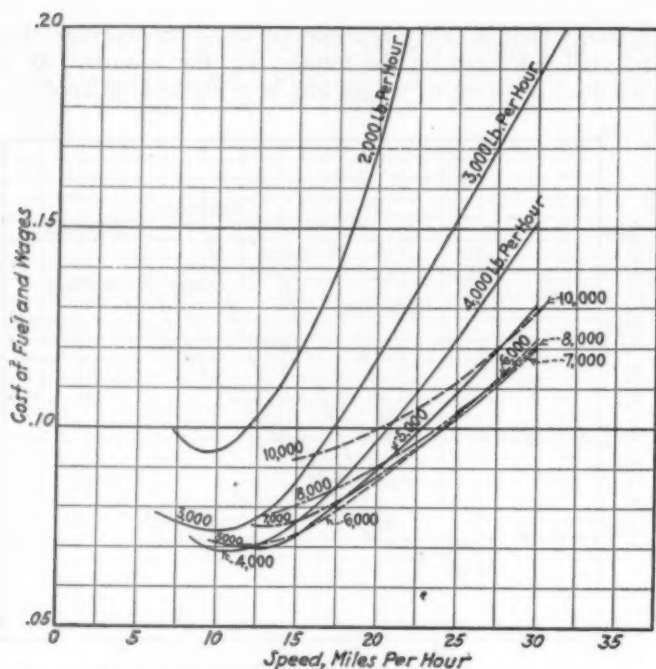


Fig. 9—Cost of Fuel and Wages at Various Fuel Rates—Continuous Operation

combined cost will more nearly correspond with those which gave the lowest unit fuel consumption, and vice versa.

The data on the cost of fuel and wages combined for a typical case as in Table III are presented graphically in Figs. 9, 10 and 11. Fig. 9, illustrating the variation in cost for constant rates of firing, shows that the low rates of 2,000 lb. and 3,000 lb. an hour are uneconomical over the entire range of speed. Below 12 m. p. h. a fuel rate of 4,000 lb. an hour shows the lowest cost. From 12 m. p. h. to 16 m. p. h. a rate of 5,000 lb. an hour is most economical. From 16 m. p. h. to 24 m. p. h. the lowest cost is shown at 6,000 lb. an hour, and at this rate of firing costs are not much above the minimums at any speed, although above 24 m. p. h. 7,000 lb. an hour shows the lowest combined cost. When the firing rate is increased to 8,000 lb. an hour, the cost at

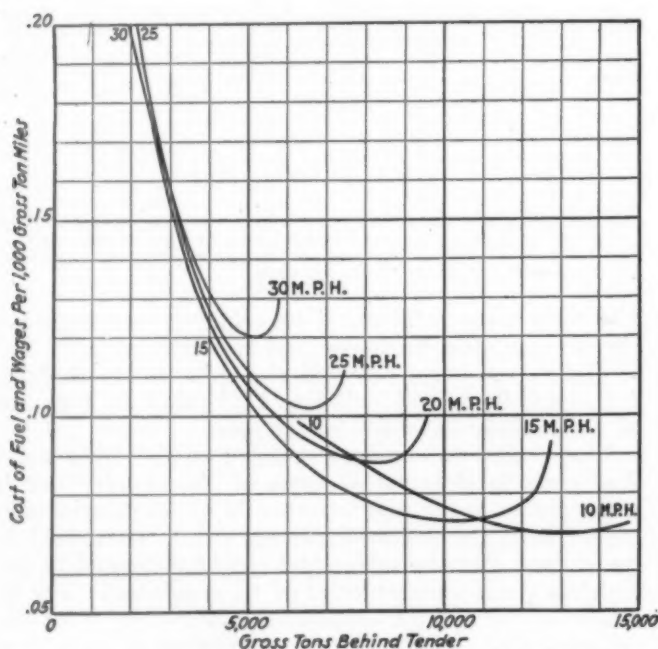


Fig. 10—Cost of Fuel and Wages at Various Speeds—Continuous Operation

low speed is increased considerably but at higher speed the cost is near the minimum. The high rate of 10,000 lb. an hour shows higher costs throughout the entire range, although not as high as obtained with fuel rates of 2,000 and 3,000 lb. an hour.

Similar data showing the variation in costs on the

Table IV—Wage Rates for Train Crew

	Per day	Per hour	Per mile
Engineer .....	\$8.13	\$1.016	.0813
Fireman .....	5.42	.677	.0542
Conductor .....	6.62	.827	.0662
Brakeman .....	5.20	.65	.0520

basis of tonnage and speed are shown in Fig. 10. Starting with the lowest speed it is evident that 10 m. p. h. gives the lowest combined cost from a maximum of about 16,000 tons down to 11,000 tons. At 15 m. p. h. the greatest load than can be hauled is 12,700 tons. From 11,000 tons down to 4,000 tons this speed shows the lowest cost and the range might be extended still further if more data were available. A feature to be noted on this chart is that when operating at low speed the tonnage can be varied over a considerable range without making any substantial change in cost, except when the tonnage is near the maximum. At the higher speeds, on the other hand, a slight change in tonnage has a pronounced effect on the cost.

The attention that has been given to the gross ton-miles per train-hour, as a criterion of efficient operation

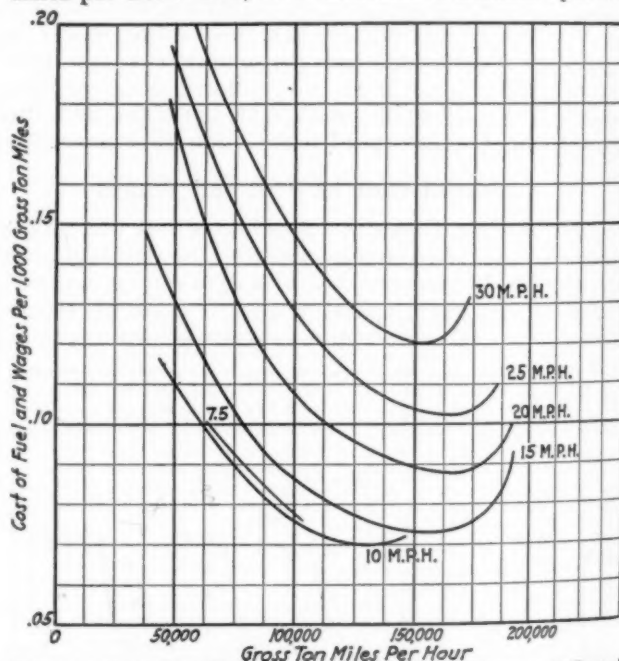
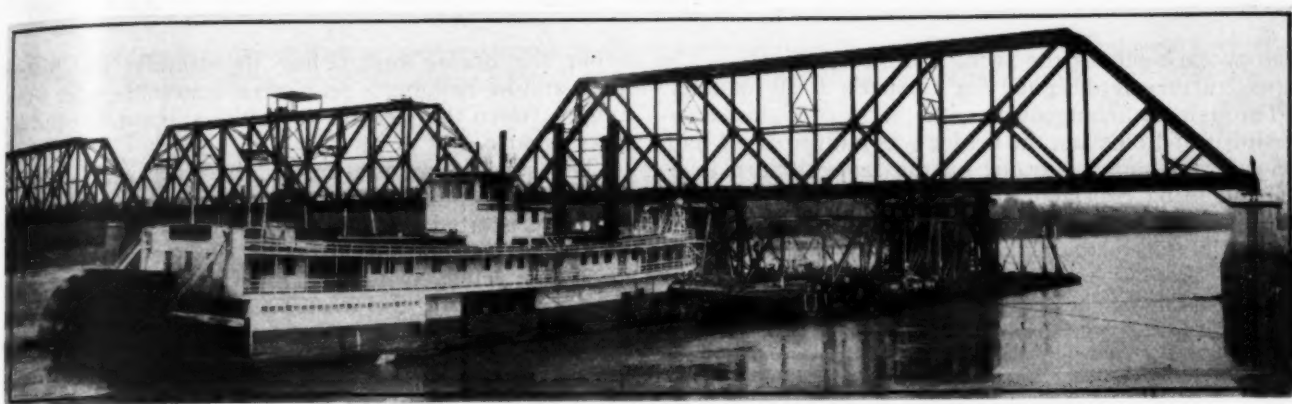


Fig. 11—Relation Between Ton-Miles per Hour and Cost of Fuel and Wages—Continuous Operation

makes Fig. 11 of special interest. The first characteristic to be noted is the wide range of cost with a constant rate of production in ton-miles per hour. Considering the results at constant speed it is found that an increase in the ton-miles per hour does not necessarily carry with it a decrease in the cost of fuel and wages. For example, at 15 m. p. h. and a rate of 160,000 ton-miles per hour the combined cost is 7.3 cents per 1,000 gross ton-miles, but when the rate is increased to 190,000 ton-miles per hour the cost rises to 9.2 cents. There is no constant rate of ton-miles per hour which gives minimum costs over a considerable range of speed and on the whole the rate of fuel consumption seems a better guide to economical operation as gaged by the combined cost of fuel and wages.

(Part II will appear in next week's issue.)



The Span was Transferred to its Location in the Bridge on Car Floats With the Aid of Two River Steamboats

## Float 300-ft. Span Into Place in a Swift Current

*Louisiana Railway & Navigation Company builds bridge over Atchafalaya river in the face of severe obstacles*

FEW American rivers have given more trouble to the bridge builder in recent years than the Atchafalaya, and for this reason the construction of bridges across this stream has usually embodied features of distinctive interest. Thus, the building of the bridge of the Louisiana Railway & Navigation Company, completed last year, was distinctive for two reasons. It entailed the display of particular resourcefulness in meeting a serious difficulty in the substructure work and it embodied the employment of an ingenious method for the erection of one of the spans of the superstructure, a 300-ft. riveted through truss span. It is also worthy of note that the primary causes responsible for the particular features mentioned are those which have been the source of difficulties elsewhere on this stream—deep water, a swift current and an unstable bottom.

The new bridge is the principal feature of a new line constructed by the railroad from Moreauville, La., to the Mississippi river at Red River Landing, a distance of 21.1 miles. This new line replaces an old line extending for 17.2 miles from Moreauville to Naples, on the bank of Old river (a cut-off channel of the

Mississippi river), whence the trains were moved by ferry via Old river and across the Mississippi to Angola on the east bank. This represented a total ferry haul of 8.3 miles and was a source of delay to traffic under even the most favorable conditions, while during times of fogs, when the boats were compelled to tie up, it was responsible for the complete suspension of train movements.

The new line swings to the south after leaving Moreauville and extends through Simmesport to Red River Landing, which is directly across the Mississippi river from Angola. This route reduces the ferry transfer distance to 1.2 miles, which is a saving of 7.1 miles as compared with the old route. The opening of the new line made it possible to shorten passenger schedules over one hour and freight schedules about six hours between Shreveport and New Orleans.

The Atchafalaya river is crossed at Simmesport by a single-track bridge consisting of 1,200 ft. of steel structure with wooden trestle approaches at each end. The steel structure is made up of five through truss spans symmetrical about the pivot pier of a 300-ft. swing span, there being one 300-ft. and one 150-ft. fixed

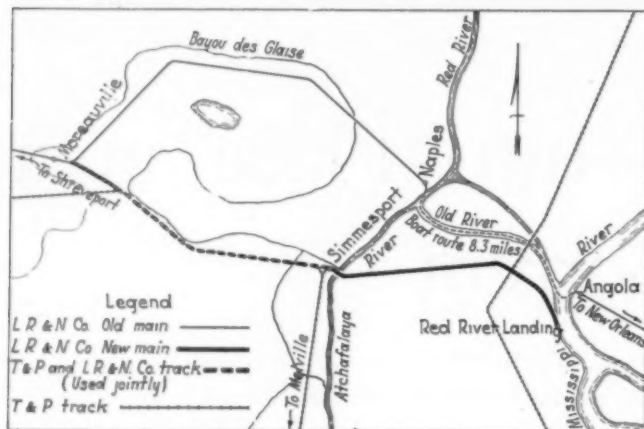


The Finished Bridge—The Falsework in the Foreground is Part of That on Which One of the Spans was Erected Prior To Floating It Into Place



span on each side of the swing span, respectively. The superstructure is designed for Cooper's E-50 loading.

Through an arrangement with the state highway department of Louisiana the bridge was built to carry both railway and highway traffic on the same deck, a nominal toll being collected for vehicular and other traffic. The width of the deck between hand rails is 17 ft. 8½ in. and the top of the planked deck is flush with the top of rail. A three-foot walkway is provided across the bridge outside of the trusses on one side. It is planned to install an automatic signal system to insure that the bridge is clear of all traffic before trains enter upon it.



Map Showing the New and Old Lines

The piers supporting the bridge proper are of reinforced concrete construction, carried to a depth of about 86 ft. below low water level. They were built in place as open caissons and sunk by excavating from within and building up the concrete walls as the sinking progressed. A concrete mixing plant was established on the Simmesport side of the river and concrete was delivered to the piers by means of cableways. The piers are numbered from west to east as follows: 6, 1, 2, 3, 4, 5, 7. Owing to an unfavorable stage of the river at the inception of foundation operations, work was undertaken first on Piers 1 and 5, to be followed by work on Piers 2 and 3, and all four of these piers were carried to the desired depth without extraordinary difficulty. Work then was begun on Pier 4, in spite of continued high water and hazards involved, because of the urgency of meeting the construction schedule.

Work was started on Pier 4 when the river was at a stage of 34 ft. on the gage, which means a depth of water of 69 ft. at the site of the pier. The pier was sunk to the river bed and an attempt was made to continue the sinking, but owing to the force of the current it was impossible to control its position or keep it plumb and it soon leaned sharply to the east. Accordingly, work was stopped until the water receded, when an attempt was made to right it by fastening a 2½-in. cable to the top of the pier and passing it over the tops of Piers 2 and 3 to Pier 6, where a strain was applied to the line by means of block and fall lines and a screw jack, while a clamshell bucket was employed to excavate on the west side of Pier 4. This was continued for three days when the pier suddenly broke off at the bed of the river under a strain estimated at about a million pounds.

This effectively blocked any further efforts to build a pier on the center line of the bridge at this location, so work was suspended until a more favorable stage of the river, when the predicament was overcome by sinking cylinder piers both up-stream and down-stream

from the bridge center line to straddle the broken pier, and by building a reinforced concrete girder spanning between the piers to form the support for the superstructure.

The steel work was erected in place on falsework with the exception of the east 300-ft. span. The erection was started from the west side at the same time that work was started on Pier 4, the other piers having been completed. The west 150-ft. span was erected first, followed by the west 300-ft. span and the draw span. By the time this was done the stage of the river was very unfavorable and it was necessary either to delay the completion of the bridge for several months or devise a method of erecting the last 300-ft. span, which did not require use of falsework in the channel.

Accordingly arrangements were made to erect this span on falsework driven in a more favorable location and then float it into place on the piers by means of barges and steamboats used in the ferry service. This called for careful planning. The falsework was located at right angles with the bridge just down-stream from and adjacent to Pier 2, which was used as a convenient reference point for the establishment of levels, the span being erected at exactly the elevation of the bridge on the piers. Another important point was to determine the ability of the barges to carry the load. It was found that a 12-car and a 14-car barge, each 37 ft. wide, equipped with stiffening trusses, would serve the purpose.

Five bent frame towers were erected on these barges, spreading the load over sills and blocking that provided a distribution over three bulkheads. The tops of these towers were carried to an elevation that permitted of the use of blocking on the caps to adjust for changes in the water stage between the time that the towers were completed and the day on which the transfer would be made.

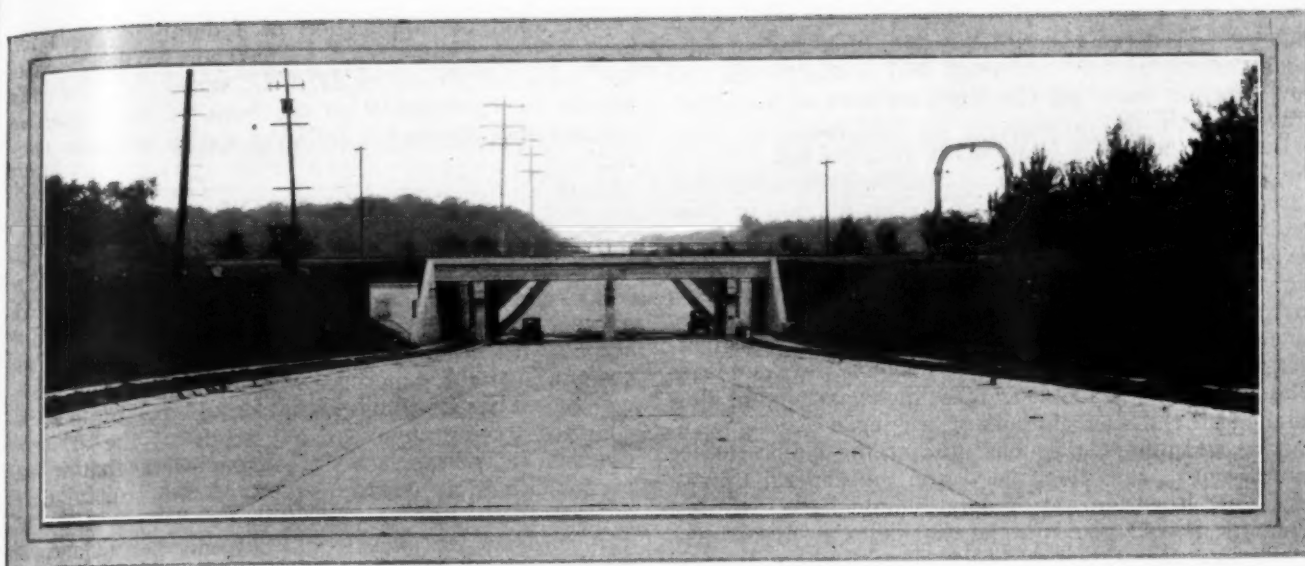
To get the barges under the span, it was necessary to cut two bents out of the falsework supporting the spans. The barges having been weighted down with water in the holds, they were lightened for the purpose of lifting the span clear (nine inches) by pumping out this water by means of six-inch syphons. This move was made after careful calculations with reference to ballasting one bulkhead in each end of the barges so as to balance the load on the barges.

The barges were maneuvered by two stern-wheel transfer boats used in the ferry service, for while one of them could possibly have served, the use of two assured much more certain control in handling the load in the swift current. The operation was carried out without a hitch. In only four days from the time that work was started in the erection of the falsework on the barges until the span was in place on the piers. The span weighed 600 tons.

The project was carried out under the direction of C. R. Mee, chief engineer of the Louisiana Railway & Navigation Company, Shreveport, La., to whom we are indebted for the information presented here. Hedrick & Frost were the designing engineers and directed the construction of the substructure by the railroad's own forces. The steelwork was fabricated by the Virginia Bridge & Iron Company, Roanoke, Va., and was erected by the Wisconsin Bridge & Iron Company, North Milwaukee, Wis. To protect the piers against scour in the bed of the river, a considerable area both up-stream and down-stream from the bridge has been covered with a woven willow mattress, sunk to the bottom of the river and held in place with large quantities of stone. This mattress work was done by the Woods Brothers Construction Company, Lincoln, Nebr.

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# Who Should Pay for Grade Crossing Separation?\*

*Chaotic organization of highway control is the primary obstacle to a satisfactory answer*

By Robert H. Ford

Assistant Chief Engineer, Chicago, Rock Island & Pacific

THERE are 236,283 railway grade crossings in the United States and in spite of vast expenditures being made annually for grade crossing separations, it is a disquieting fact that highway grade crossings continue to increase at a faster rate than they are being eliminated; we have developed no definite objectives. The matter is still in the experimental stage and as yet we do not know how to meet the problem. The highway grade crossing problem is in reality only an auxiliary (although an exceedingly important one) in the growth and development of what might be termed the highway transportation giant, which has so recently forged to the front as a principal contender with the railways in the national transportation business.

Modern transportation methods demand that the present antiquated methods of diffused control shall give way for a co-ordinated federal and state control, simplified and centralized in such a manner as to permit the state highway system to function as an interstate as well as intrastate agency. It should be so organized and administered that it will function in the public interest and in a manner similar to the railways, all of which are similarly co-ordinated through the American Railway Association with respect to administration and through the Interstate Commerce Commission with respect to policy and finance.

Among the benefits to the public from a plan of this character will come the closing up of unnecessary and

burdensome grade crossings. Approximately thirty per cent of these grade crossings could be summarily abolished if this were done. Consider the terrific waste of human lives and the useless expenditures each year largely because no plan of central control has been evolved so that this can be definitely accomplished.

Except for that part of the highway mileage which has been modernized since the introduction of the automobile, our highway system is largely the result of meandering lanes for the use of the slow-moving horse and wagon. Within the space of a few years, the horse has practically disappeared from the roads and has been replaced by approximately twenty-four million automobiles and mechanically-operated, high-power machines of vastly greater speed, weight and capacity, which now operate over highways at express-train speed.

The entire scheme of "horse and buggy" highway locations, maintenance and supervision, is totally unsuited for modern highways. Highway supervision of the horse age, however, at least had the advantage that it was generally uniform and reasonably adequate, while today it is neither. With the advent of the automobile, there has come the most urgent need for a complete overhauling of state highway legislation and practices for the control of our highway system.

## Change of Control Is Necessary

The first and most rational step for accomplishment in this direction is an agreement on essentials and principles between the various states, leading ultimately to the enactment of suitable legislation so as to place the state highway systems under the public service com-

\* Abstracted from a paper presented before the 15th annual convention on highway engineering held at the University of Michigan, Ann Arbor, Mich., February 20-23.

missions of their respective states in the form of a highway bureau and abolish the state highway commissions, country road commissions, and similar bodies that now function under the obsolete state laws of the horse-drawn vehicle age.

Because the job is in no sense political but requires the highest skill and technical training, these highway bureaus should be placed under the jurisdiction of competent engineers, which in effect is equivalent to transferring the state highway department from the state highway commission, which would be abolished, to the jurisdiction of the state public service commission and by suitably enlarging its powers. Let them take jurisdiction over the county and other public highways, meanwhile rendering available to these highway bureaus thus established the vast amount of technical, economic, financial and other data which flow to the public service commissions. For the same reason the Federal Bureau of Public Roads at Washington should be transferred from its absurd place in the Agricultural department to the Interstate Commerce Commission, where it would have access to and be a part of the organized machinery of transportation, as well as construction.

Suitable federal highway legislation should be substituted for the present loosely drawn federal highway acts, under which seventy-five million dollars are appropriated annually for road building throughout the country. Whatever its merits, the federal bureau of highways certainly does not fit in or even begin to comprehend the national highway problem as a co-ordinating transportation agency. We should modernize our system of highway administration and control to meet present-day requirements and cut out the useless and cumbersome machinery of the horse age.

In a notable address before the American Road Builders' Association, E. W. James, engineer of the Bureau of Public Roads recommended that a definite classification of grade crossings be made, based upon the relative value of their elimination to the traveling public, and that a definite program for eliminating crossings of the highest classification be adopted by each state and by each of the railways within the state. Presumably Mr. James had in mind that by this means there would also be eliminated those crossings which, by reason of their relative unimportance, would not justify expenditures for grade separation.

#### Those Who Benefit Should Share Expense

He stated also that "if the program of elimination, based on a classification, is to be founded on an economic saving to highway traffic, it is logical and fair that there be a liberal allotment of costs to the general public, as by such a plan, it would make possible the speeding up of the entire program of grade crossing elimination."

This is, in effect, an endorsement of the fundamental principle heretofore advocated of allocating the cost of grade separations to the parties benefited in proportion to the benefits received, so far as they can be shown, as a substitute for the unsound, unscientific and thoroughly uneconomical policy of arbitrary apportionments which have nothing to justify it except that it is convenient and easily understood by petty public officials and politicians, and as such, has crept into many state regulations. The so-called benefit basis for allocation of cost has received the unanimous recommendation of a special committee of prominent railway engineers under the chairmanship of Hadley Baldwin, chief engineer of the Cleveland, Cincinnati, Chicago & St. Louis, which committee was appointed to study and

report upon the application of federal-aid funds for grade-crossing elimination. The report of this committee, made on November 21, 1927, states that "the costs should be apportioned on the basis of the respective benefits resulting to the railways and to vehicular traffic."

#### Endorsed By Others

The same principle has been followed in an interesting study by M. L. Hutton, engineer of the Iowa State Highway Commission, in connection with research work on cost apportionments. These conclusions are also in accord with the finding of the Committee on Grade Crossings of the American Railway Engineering Association. The late Judge John E. Dolman of the Missouri bar, after an exhaustive study of the arbitrary assessment basis, reached the conclusion that it was as inequitable as it was unfair and the fruitful cause of controversy and misunderstanding.

A co-ordinated plan, would not only permit a classification of the 236,283 existing grade crossings as between those that are necessary and those that are not, but it would also afford opportunity to separate the crossings that should be separated from those where separation is not economically justified. The greatest stumbling block, however, to any general program of grade separation or grade crossing reduction, is the arbitrary and unsound methods for cost apportionment, and while there are decided evidences of a better grasp on the situation in some states, it must be said that the reverse is the case in other states.

#### Arbitrary Division Obstructs Progress

Reliance upon the laws of the horse-drawn vehicle age to force separations or, by similar methods, to compel arbitrary cost apportionments, will foredoom to failure any constructive effort for a solution of this problem. It is the fruitful source of irritation and misunderstanding between the affected interests because of its manifestly unfair and inapplicable provisions from the standpoint of modern requirements, irrespective of state laws or court decisions, which are frequently held as a threat or a club in an effort to force acquiescence. Any basis which apportions the cost equally between the state and the affected railway on the theory that they are equally benefited, is wrong and will never lead to success in working out the problem because, and for the reasons heretofore stated, accruing benefits are not arrived at in this manner, and every engineer and economist knows it.

Ultimately I believe that general formulas in the nature of guiding principles will come into general use for this purpose. Until this has been accomplished, a sufficiently liberal portion of the cost must be assumed by the general public to make it well within the ability of the average railroad to participate in the state program.

A little reflection will indicate that the public interest is best served if, when two separations are necessary, they can be secured on an apportionment of say twenty-five per cent to the railway than by holding out for a fifty per cent or greater division to the railway on one separation. Thus no separation is obtained until the matter can be fought out singly through court action, because one of the parties believes that such a division is as unfair as it is unjust. It has been my observation that, in those states where the apportionment of cost is the more liberal, the speediest and most satisfactory action by all parties is obtained.



# Grain Rate Levels Are Reasonable

*But I. C. C. examiners favor revision on mileage scale basis  
to comply with Hoch-Smith resolution*

WASHINGTON, D. C.

**A** FINDING by the Interstate Commerce Commission that the general level of the freight rates on grain and grain products throughout the western district cannot be condemned as unreasonable under the interstate commerce act, nor be reduced at this time by mandate of the Hoch-Smith resolution, but that the rates should be redistributed more equitably as between producing areas in consideration of relative mileages, is recommended in a proposed report in Part 7 of the commission's rate structure investigation. The report is by Examiners Arthur R. Mackley and George T. Hall and was made public on April 20. The recommendations would increase rates in some sections while lowering others.

While the condition of the wheat farmer has been improving within the past few years and is continuing to improve, the report says, "there is still depression in agriculture, within the meaning of the resolution." However, according to the examiners, the answer to the question whether, even with a continuing depression in agriculture in some degree, the rates on grain throughout the western district are reasonable and just; whether they are properly related to the rates on other traffic and will permit of the free movement of traffic, and are the lowest possible rates consistent with an adequate transportation service, "must take into account not only comparisons of distance, transportation conditions and ton-mile and car-mile earnings on grain and other commodities, but also the question whether the general level of rates on all traffic as a whole is sufficiently high to accord to the carriers the rate of return contemplated by law, including section 15-A of the interstate commerce act, which the commission construes to permit, but not to guarantee, the carriers to earn a maximum of 5.75 per cent on the fair value of the property devoted to the transportation service."

While the Southwestern carriers are found to be better off financially than the other western lines the report says that reduction in their rates, even if otherwise warranted, could not be made without consideration of relations in rates on wheat throughout the whole of the western district.

## Yardstick Scale Proposed

For the purpose of redistributing the rates the report tentatively recommends a general "yardstick" maximum mileage scale for grain and grain products for the entire western district on the basis of 90 per cent of the so-called 12244 scale—now applicable from Oklahoma to Texas, Arkansas and Missouri and from the Texas panhandle to Kansas City, but lifted beyond 500 miles and subject to a raising or lowering of the scale level in order to return approximately the same aggregate revenues as at present.

If the commission believes the entire western district too much territory to be covered by one scale the examiners recommend not more than two scales—one for the western group and a higher one for the intermountain group, the purpose being to give all parts of the western district as nearly as possible the same general level of rates on grain.

It is also recommended that the "rate break" system

of making rates, by combination of flat rates to primary markets and proportional rates beyond be approved for exclusive application through primary markets on direct routes, with exceptions and by overhead rates with transit over indirect routes only upon permission of the commission.

Other recommendations are that wheat and flour should be permitted to move at the same rate; that rates on grain and grain products should be made with reference to commercial necessities as well as with reference to strict transportation conditions; that ports of export should be equalized to the fullest possible extent, within reasonable limits, and that present excessive free transit stops and out of line hauls be curtailed.

Exceptions to the report will be received by the commission up to May 20 and the proceeding is assigned for oral argument at Washington on May 27.

Tentative conclusions are reached as to some of the issues presented but not as to others, because of the lack of time for mature consideration of the record, which consists of some 53,000 pages of transcript, upwards of 10,000 pages of transcript from other records made a part of the present record, 2,100 exhibits, and 15,000 pages of briefs, the last installment of which was submitted February 15, 1929.

The report is issued in these circumstances, by direction of the commission, "in the belief that early exceptions and oral argument will so crystallize and clarify the numerous and complex issues as to expedite the final report of the commission"; and many issues are left to be dealt with after argument.

The inquiry involves rates and practices affecting the transportation of grain and grain products throughout the western district (on and west of the Mississippi River, including eastbank crossings) and in Illinois; from Lake Erie ports to Atlantic ports on ex-lake grain (grain transported across the Great Lakes to Lake Erie ports); and from all points in the western district to all ports of export.

"Any single or collective human agency assuming to eliminate complaints against the grain-rate adjustment appropriates to himself a supersense little short of omniscience," the report says in one place, stating that many of the rates involved are the subject of pending complaints "and doubtless always will be."

While the text of the proposed report, which consists of 159 pages, deals only briefly with the economic condition of the grain farmer, there is an appendix of 52 pages, prepared by Dr. C. S. Morgan, an economist on the staff of the commission, which reviews the evidence on that subject and includes a discussion of "Who Bears the Freight Rate?"

"So far as the next few years are concerned," says Dr. Morgan, "barring unexpected changes in the condition of supply in other producing countries, the present buyers' market is likely to continue. It will be difficult, therefore, for the American farmers to retain any advantage they might secure from a general rate reduction."

Following are some extracts from the more general parts of the Examiners' report, which includes a de-

tailed discussion of the present grain rate structure and of the various proposals for modification of it which were the issues at the hearings:

Financial Condition of Carriers

The percentage rates of return of class I carriers in the western district, by regions, for the calendar years 1921-28 were as follows:

	Regions			
	North western	Central western	South western	Western District
1921	1.42	4.45	3.17	3.12
1922	2.78	4.07	3.27	3.45
1923	3.45	4.50	3.65	3.96
1924	3.12	4.21	4.34	3.87
1925	3.60	4.41	4.37	4.13
1926	3.83	4.86	4.56	4.45
1927	3.40	4.28	3.93	3.92
1928	4.05	4.53	4.47	4.36

These percentages would have been higher if based on the commission's tentative or final valuations, and if accrued depreciation had been excluded. For ten railroads having 75 per cent or more of their mileage in western trunk line territory the average rate of return on book value was 2.97 per cent in 1927. The composite earnings of the Great Northern, Northern Pacific and Minneapolis, St. Paul & Sault Ste Marie in 1927 yielded 4.75 per cent on the commission's valuation. During the seven years after the termination of federal control these roads were short \$189,775,069 of making a 5.75 per cent return on property investment and \$136,265,151 short of that return on the commission's valuation. In the year 1927 the corresponding shortage was \$12,758,736 on the commission's valuation. The Great Northern and Northern Pacific during the ten-year period 1916-1926 added \$216,144,016 to their investment, but in 1926 their net railway operating income was \$3,394,410 less than for the year ended June 30, 1916, before they made this additional investment. The carriers maintain that the unfavorable showing is due not to a diminution of traffic, but to inadequacy of rates, particularly the reductions of 13 per cent on wheat and 21.7 per cent on coarse grain. (64 I. C. C. 85). The producers urge that the above showing cannot be chargeable to an inadequate contribution of grain and grain products to total revenues.

In 1924 the freight revenue on grain and grain products in this district was 12.1 per cent of the total freight revenue. For the Northwestern region the corresponding figure was 16.3 per cent, for the Central Western region 10.7 per cent, and for the Southwestern region 8.9 per cent. It is estimated that the total revenues from grain and grain products in the western district in 1927 were \$178,850,929, or 10.15 per cent of aggregate freight revenues. A 10 per cent reduction would mean \$17,885,093, or 1.02 per cent of freight revenues and 4.47 per cent of net railway operating income.

It is suggested that passenger service is not paying its way. But increased passenger fares, even if warranted, would fall far short of recouping reductions on the grain traffic. As to freight, the commodities of greatest tonnage are the hardest from which to extract increased rates. This record affords no solution of the problem of where the carriers could be recouped from other traffic for substantial reductions on grain.

General Rate Reduction Not Warranted

From the showing made upon this record the general level of the rates on grain and grain products can not be condemned as unreasonable under the interstate commerce act. Nor can that general level be reduced at this time by mandate of the resolution. The record however does require a consideration of the general method of making the present rates, with a view to correcting undue preferences, as well as any inequitable distribution of transportation revenues.

For many years through rail rates on grain and grain products have been largely the combinations of flat rates to and proportional rates from the primary markets, or the so-called rate-break combinations. An important issue in this proceeding is whether the rate-break system shall be discontinued and through overhead rates with transit exclusively used. The rate-break plan exclusively over direct routes, subject to certain restrictions is believed to be practicable, and it would correct many, if not most, of the complaints against existing market relations. There seems to be merit in the suggestion that a return to the pre-war degree of rate-break combinations and market equalizations would do more than any one thing to quiet the complaints of the markets concerning their relation to each other. Whatever method is found to be proper should provide the producer with at least two competitive markets. Final conclusion as to the appropriate basis for

making rates through the primary markets should, however, await oral argument.

Present Adjustment Fairly Satisfactory

Before considering proposals as to changes in the present method of making the flat rates to markets and intermediate points, it is only fair to say that while the present rates lack uniformity, representing a gradual tinkering over a period of some forty years, they have been fairly satisfactory to shippers, carriers and markets. Prior to the present proceeding there was no general complaint against these rates. The outstanding complaints came from the southwest, as a result of the application of the 12244 scale to the Texas ports and from South Dakota which alleged unreasonableness and an undue preference of Minnesota to Minneapolis and Duluth. The latter situation was wholly, and the former partially, due to a conflict of intrastate and interstate levels rather than to improper methods of making the interstate rates.

The advisability of making the flat rates into the markets and to intermediate points on a mileage basis was freely discussed. Mileage rates would not permit of the elasticity required by competition and would give to each market a monopoly of the grain in the territories contiguous to it and deprive the producer of the benefit of certain competition. The present adjustment reflects the best judgment of the traffic experts of both carriers and shippers of what is a practical adjustment; and the benefits of mileage rates are highly speculative. Flat rates into markets are now made quite generally with relation to mileage, subject to considerable groupings of origin and destination. There are mileage scales prescribed by the commission now in effect as the going rates in extensive sections of the southwest and western trunk line territory. That mileage rates, possibly with minor groupings, into the first primary market are feasible is conceded by a prominent official, with years of experience in the making of grain rates, of one of the most important western trunk lines, which serves not only a heavy producing territory, but most of the important primary markets. The carriers themselves have been, and are, resorting to mileage scales, subject to some groupings, to correct alleged inequalities.

Maximum Mileage Yardstick Recommended

Even a mileage scale would seem to require some groupings to meet cross-country and other competition. It is believed that a mileage scale, with limited groupings, for application into the first rate-break market, to ports of export, and between interior points, would be feasible. A maximum yardstick mileage scale should be established for measuring rates between specific points or groups, using the average mileages in the latter instances. To that extent a mileage scale is recommended at this time. Further consideration may be given upon oral argument as to whether a strict mileage scale should be employed.

A pertinent question is whether there should be one yardstick mileage scale for the entire western district or a series of scales. Perhaps no commodity is more competitive than wheat. While moving at different periods of harvest, the wheat crops of the various sections moved continuously throughout the year, in well defined channels, and in a broad way may well be looked upon as one huge crop and the entire western district as one rate group. Such a view would necessarily ignore differences in transportation conditions. Relative costs of service are now largely ignored in making the same rate on flour as on wheat, lower rates on coarse grains than on wheat, granting extensive out-of-line hauls, numerous transit stops, and in other adjustments. One general yardstick scale maximum for grain and grain products throughout the entire western district will merit serious consideration. If conditions in the mountain Pacific group seem to require a higher basis there might well be one scale for that group and a lower and basic scale for the remainder of the western district and Illinois. Whatever difference in service and cost of transit there may be as between the carriers into Minneapolis and Duluth, on the one hand, and into the Missouri River and the southwest, on the other, might well be subordinated to the broader conception of one general basis of rates for the larger area, with opportunity to all producing sections within that area to reach primary markets and ports on the same general basis. The northern lines may meet the Canadian competition voluntarily, but the commission would hesitate to order rates reduced on that account.

In arriving at proper basis for a basis of rates for all flat shipments the purpose should be to redistribute, rather than to reduce, aggregate revenues. A practical, and the most convenient, starting point would seem to be the 12244 scale (101 I. C. C. 116). In the absence of a traffic test it is difficult to judge accurately what percentage of that scale would accom-



plish this purpose. The bulk of the movement is to the primary markets and ports of export direct. The rates to the primary markets and to the Pacific ports are below the scale. The rates to the Texas ports, from the only territory—Oklahoma and Texas—shipping to those ports, are on the scale basis. The rates in parts of the intermountain group—Colorado, Utah, and southern Idaho—substantially exceed the scale basis, but the volume of movement is relatively small.

It would seem that 90 per cent of the 12244 scale would be an appropriate basis for a yardstick scale for use throughout the entire western district, or as the basic scale in the western group, if two scales are thought to be advisable. It will be understood that this percentage is only tentative.

This suggestion is for rates into the first rate-break market, upon the assumption that the rate-break combinations are to continue. If they are to be abolished, and overhead through rates through primary markets substituted, the scale should be higher. Further the 12244 scale should be lifted beyond 500 miles, where it now flattens out. Ninety per cent of the revised scale would result in rates for hundred-mile blocks as shown below. The scale should be appropriately graded for intermediate distances:

Miles	Cents per 100 lb.	Miles	Cents per 100 lb.
10	6	800	38½
50	9½	900	41
100	13½	1000	43
200	18	1100	45½
300	22½	1200	47½
400	26	1300	50
500	30	1400	52
600	33½	1500	54.5
700	36		

These figures are for single-line application. The question of figuring mileages, rates for joint hauls, and possible minor groupings, should be the subject of suggestion in exceptions and on oral argument.

#### Effects of the Suggested Scale

The suggested scale would result in increases in rates from North Dakota to Minneapolis and Duluth, from Kansas to Kansas City, and from Iowa to contiguous primary markets. The former are so low that any general basis of rates prescribed in this proceeding, as reasonable maximum rates, on a basis high enough to permit the carriers to live, would increase them. The same is true largely of the rates from Kansas to Kansas City. The proposal would considerably reduce the rates from Kansas to Texas gulf ports, which are represented by Kansas interests to be of great importance to the Kansas producer. It would also substantially reduce rates from Oklahoma to Texas ports and to Kansas City, and from much of the intermountain territory to both eastern and western destinations. These are only a few of the certain effects of the scale. Whether, based on the actual movement of shipments as a whole during any reasonable test period of the past, the scale should be increased or reduced, must be left for further consideration in exceptions and oral argument.

The foregoing suggestions are made upon the assumption that, under the Hoch-Smith resolution, the relation of rates is of an importance second only, if at all, to that of their general level, and that rates in some localities would be lifted to the level of a reasonable general scale, in a cooperative effort of all localities to achieve an adjustment equitable for the territory as a whole, and permitting all producing sections, especially the farther distant ones in the more sparsely tonaged districts, to market their grain in competition with other producers. If this is not to be the ultimate aim of the resolution, and each localized section is to be permitted to hold on to rates, resulting from the meeting of Canadian or carrier competition or the requirements of state authorities, lower than from neighboring and competing communities, then the rates from North Dakota, Kansas, Iowa, and other states might continue to be lower than from other producing sections, and there might be numerous bases of rates in various parts of the western district. But there would not be, in that event, any progress toward a general rate adjustment, from all grain-producing territories, to common markets, designed to give all producing sections that reasonable chance to market their grain which the resolution would seem to contemplate.

#### Economic Condition of the Grain Farmer \*

The last five or six years have been a period of substantial improvement in the condition of grain agriculture. The industry has not been able, however, to hold all the gains it has made in recent years and is still in a somewhat depressed condition. Without having regained a normal earning power, it has to carry a considerably greater than normal burden of indebtedness and to maintain, along with other classes of American society, a standard of living which has risen in considerable measure in the last decade or so.

\*From the Appendix by Dr. C. S. Morgan.

It is difficult to point to any series of years which all will agree constitute a normal period in the economic life of agriculture. Doubtless the period of approximately five years preceding the outbreak of the European War were uncommonly good years for American agriculture. The depressant factors in grain agriculture today are redundant supplies and heavy farm indebtedness. Wheat in the crop year 1927-28 had 90 per cent of its pre-war purchasing power, in July, 1928, 85 per cent, and in September, 69 per cent. There is no immediate prospect of reduction of supplies or of significant expansion of demand. The competition of newer domestic and foreign sources of supply, some of which use modern power equipment in an effort to achieve low costs, is particularly felt by the older regions of wheat production. No finding of the existence of depression should be made as to the areas of expanding wheat production in the United States.

Agriculture as a whole is also carrying a heavier burden of interest and taxes than it did before the war. The indebtedness was incurred for a number of purposes, during the period of high prices, or was accumulated as the result of the conditions which followed the collapse of agricultural prices. Some of this indebtedness has been wiped out and many farmers never became involved in it. At the present time this burden is therefore unevenly distributed. Where the losses had not been fully taken earlier, foreclosures and bank failures were still running at an unusual rate at the time of the hearings.

Much was said by the carriers of the increased efficiency of farming operations in late years. The enlarged volume of products and decreased number of workers were pointed to as proof of the soundness of agriculture at the present time. Such a view does not accord full or proper weight to the increase of farm acreage or to the added investment in machinery and equipment.

Not all of the difficulties of grain agriculture are attributable to the factors which have been named. Adverse climatic conditions have played a large part, and in some regions declining fertility is a factor of considerable moment.

Much of what has been said has applied principally to wheat. The condition with respect to oats is at least as unfavorable as that of wheat. Corn has shown great variability of position in recent years but also greater and better sustained price recovery than has wheat.

## Improvement in Railway Freight Service

WASHINGTON, D. C.

THE transportation of freight on American railways has never before been done with so high a degree of speed and efficiency as at present, according to the survey of the National Bureau of Economic Research just made public as part of the report of the Committee on Recent Economic Changes of the President's Unemployment Conference. The improvement in railway freight transportation service is described in the survey as the most notable achievement in railroad administration since the war.

The Committee on Recent Economic Changes is made up of business and labor leaders and economists, with President Hoover as chairman. The data obtained for the committee are the result of a nation-wide inquiry by the National Bureau of Economic Research, lasting more than a year, into changes that have taken place in various phases of industry and commerce since the close of the war. These data were used by the Committee in formulating its report, which is a critical appraisal of factors of stability and instability in our economic life.

The material dealing with railroad transportation was gathered under the supervision of William J. Cunningham, J. J. Hill, Professor of Transportation at Harvard University, who says in the survey:

"From the public point of view the outstanding railway development since the war has been the marked improvement in transportation service. The adequacy, speed and dependability in freight movement have never

been better. The improvement is seen in freedom from car shortages, embargoes and other restrictions, and in close adherence to scheduled transit times. The number of scheduled fast freight trains has been increased and the speed bettered so as to give earlier deliveries at destination. Incidental services have been extended and throughout the whole service there is greater effort to apply modern merchandising principles in the development and sale transportation.

"The regularity of movement and dependability of rail service have given impetus to the general practice among manufacturers and merchants of carrying smaller inventories of raw materials and merchandise. Better rail service cannot be credited wholly with this economic development but it called attention to the possibilities and led to the general movement. Certain it is that the smaller stocks would not afford adequate protection were rail service less prompt and reliable. The general reductions in inventories have released sums of capital which in the aggregate are enormous, and in buying habits have brought about profound changes far-reaching in their economic effects."

Professor Cunningham attributes the improvements in transportation service in the last few years to the large expenditures for additions and betterments of facilities and equipment, to changes in operating methods and better managerial control, to higher employee morale, and to a better understanding and more cordial cooperation on the part of the shipping public.

In the matter of speed Professor Cunningham explains that the gain has not been so much in actual speed while in motion as in the reduction of road delays. The running speed is probably little if any faster than in previous years, but the increase in multiple running tracks, design of better locomotives, installation of additional automatic signals, and the enlargements of yards and terminals have materially cut down standby losses on the roads and have favorably affected overall train speed between terminals.

## British Rate Structures to Be Reviewed

THE Railway Rates Tribunal of Great Britain has fixed May 6 for the opening of its review of the rates of the amalgamated railway companies under the provisions of Section 59 of the Railways Act, 1921, according to a recent article in the Times Trade and Engineering Supplement (London).

January 1, 1928, was the date called by law the "appointed day" which the Railway Rates Tribunal designated for bringing into operation the new schedules of rates. On that day the whole system of railway rates underwent a revolution and one of the most important changes contemplated in the Railways Act, 1921, was effected. The sum fixed by the tribunal as the annual net revenue to which the four amalgamated companies were entitled was £50,057,847 (\$243,781,715).

Section 59 of the Act provides in paragraph (1) that: "The rates tribunal shall review the standard charges and exceptional charges of each amalgamated company at the end of the first complete financial year after the appointed day, or, if the appointed day is the first day of January in any year, at the end of that year . . ." Paragraph (4) of the same section provides that: "If on any such review the rates tribunal find that the net revenues or the average annual net revenue obtained by

the company during the period on the experience of which the review is based is less than the standard revenues of the company, with such allowance (if any) as appears to the tribunal necessary to remunerate adequately any additional capital which may have been raised . . . since the date upon which the standard charges were fixed in the first instance, and that the deficiency is not due to lack of efficiency or economy in the management, the tribunal shall, unless in their opinion owing to change of circumstances the deficiency is not likely to continue, make such modifications in all or any of the standard charges and such a corresponding general modification of the exceptional charges of the company as they may think necessary to enable the company to earn the standard revenue with such allowance (if any) as aforesaid."

Thus, with the expiration of the first year under the revised rates on January 1, 1929, the rates tribunal is under mandate to survey the situation and adjust the tariff schedules so that they will produce the standard revenue for each of the four companies.

Each of the companies has, accordingly, filed with the tribunal a statement giving in detail its expenditures and revenues for 1928 and comparing its net revenue with the standard net revenue sanctioned by the tribunal under the provisions of the Act. The actual net revenue of each company, together with the respective standard revenues and deficits from the latter follow:

	Actual £	Standard £	Failed to Earn Standard Return by £
L. M. S. . . . .	16,270,000	20,326,622	4,056,622
L. N. E. . . . .	11,277,759	14,787,733	3,509,974
G. W. . . . .	7,057,023	8,312,013	1,254,990
Southern . . . . .	6,394,412	6,631,479	237,067
Totals . . . . .	40,999,194	50,057,847	9,058,653

It will be noted from the foregoing that the total actual net revenues of the four companies, during 1928, were £9,058,653 (\$44,115,640) less than the standard revenue. It will likewise be seen that the deficit of the London & North Eastern is relatively the most serious, since it amounts to about one-fourth of the standard revenue figure for this road. In total, however, the deficit of the London, Midland & Scottish, is the greatest since it amounts to £4,056,622 (\$19,755,749), or about one-third of the L. M. S. standard revenue of £20,326,622. The Great Western deficit is about one-sixth of its standard net revenue while that of the Southern is about one-twenty-eighth.

These varying percentages, it is pointed out, will greatly increase the difficulty of the tribunal if it be decided that the deficiency must be eliminated, for they may mean departures from the uniform rate system and involve the establishment of higher rates on the railways reporting the larger revenue deficits.

It is further pointed out that in the case of the London, Midland & Scottish the gross receipts for the year were £71,460,475 as compared with an estimate of £78,247,000. Had it not been for the saving in expenditure, it adds, the position of this company with respect to its standard net revenue would have been extremely serious. The estimated expenditure, however, was £64,097,900 while the actual operating costs were £58,945,437. The gross revenue of the London & North Eastern was £52,757,769 as against this company's standard gross revenue of £57,213,000. Its expenses, however, were £43,331,158 as compared with L. N. E. standard expenses of £48,854,600. The Great Western's failure to earn the standard revenue is attributed mainly to declines in its third-class passenger revenue and in its receipts from coal traffic.



# American Locomotive Company

## Elects New President

*William C. Dickerman succeeds William H. Woodin, who will retain chairmanship of board of directors*

**W**ILLIAM H. WOODIN, president and chairman of the board of directors of the American Locomotive Company, has resigned the former position and has been succeeded in it by William C. Dickerman, who was promoted from the vice-presidency of the American Car & Foundry Company. Mr. Woodin, who is also president of this latter company, will retain that position as well as the chairmanship of the American Locomotive Company.

Mr. Woodin is a descendant of a family which has been associated with railway car building practically since the inception of that industry in this country. In 1842 his grandfather was one of the organizers of the

Woodin was appointed district manager of the Berwick plant.

He next became assistant to the first vice-president of the new company and in 1902 he was made a director and assistant to the president, having general direction of the company's affairs under President Frederick H. Eaton, whom, on February 1, 1916, Mr. Woodin succeeded in the presidency.

Mr. Woodin first became president of the American Locomotive Company in December, 1925, succeeding the late Andrew Fletcher. In May, 1926, however, he temporarily relinquished the position and was succeeded



William H. Woodin



William C. Dickerman

Jackson & Woodin Manufacturing Company, Berwick, Pa., which was one of the concerns merged in the American Car & Foundry Company when the latter was organized in 1899.

He was born at Berwick, Pa., May 27, 1868, and received a technical education at the Columbia University School of Mines which he attended in the class of 1890. Upon leaving college he entered the shops of the Jackson & Woodin Manufacturing Company at Berwick and in 1892 was made general superintendent of that plant. Three years later, in 1895, he was elected vice-president and his promotion to the presidency came in 1899. With the merging of the plant in the American Car & Foundry Company in the latter year, Mr.

by Frederick F. Fitzpatrick, former president of the Railway Steel Spring Company. Upon the death of Mr. Fitzpatrick in November, 1927, Mr. Woodin again became the American Locomotive Company's president and retained the position until the present time. He is also a director of the Montreal Locomotive Works. Recently he was honored by Juniata College which conferred upon him the degree of Doctor of Laws.

Mr. Dickerman was born on December 12, 1874, at Bethlehem, Pa., and following his graduation from Lehigh University in 1896 entered the employ of the Milton Car Works, Milton, Pa., of which his father was a partner and general manager. He there served successively in the auditing, purchasing and engineering departments. Like Mr. Woodin, Mr. Dickerman was

appointed a district manager of the American Car & Foundry Company when the latter absorbed the Milton plant. He served in this capacity at Milton until his transfer to New York in 1900. In 1901 he was appointed sales agent of the American Car & Foundry Company and later, general sales agent. In 1905 he was elected vice-president.

During the war Mr. Dickerman was in charge of the American Car & Foundry Company division which successfully executed munitions contracts on behalf of the United States and the allied nations. Since 1919 he has been vice-president in charge of all operations of the company.

Thus with Mr. Dickerman's rise to its presidency, the American Locomotive Company comes under the direction of a man of wide industrial experience. Among other affiliations he is a director of the American Car & Foundry Company, the American Car & Foundry Securities Company and the J. G. Brill Company.

## Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading amounted to 971,730 cars in the week ended April 13, representing increases of 59,071 and 22,169 cars respectively compared with the totals in the corresponding weeks of 1928 and 1927, due principally to the heavy movement of miscellaneous freight. The totals for forest products, ore and less-than-carload merchandise also were larger than in either of the two preceding years. Loading in all districts was larger than in the corresponding week of last year. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

Revenue Freight Car Loading  
Week Ended Saturday, April 13, 1929

Districts	1929	1928	1927
Eastern	228,178	217,303	226,001
Allegheny	205,012	192,413	199,147
Pocahontas	53,696	47,611	59,120
Southern	156,989	147,840	158,750
Northwestern	116,087	109,306	115,317
Central Western	134,122	126,677	125,077
Southwestern	77,646	71,509	66,139
Total Western Districts	327,855	307,492	306,533
Total All Roads	971,730	912,659	949,561

Commodities	1929	1928	1927
Grain and Grain Products	34,498	36,914	34,397
Live Stock	24,210	24,567	25,644
Coal	139,476	140,681	152,651
Coke	11,564	9,908	11,615
Forest Products	69,237	62,425	67,893
Ore	15,121	8,665	12,787
Merchandise L.C.L.	266,755	259,377	264,145
Miscellaneous	410,869	370,122	380,429
April 13	971,730	912,659	949,561
April 6	956,364	919,352	953,907
March 30	967,029	948,743	986,462
March 23	960,698	950,194	1,003,536
March 16	957,460	942,572	1,001,932

Cumulative total, 15 weeks.....14,074,774 13,624,207 14,444,593

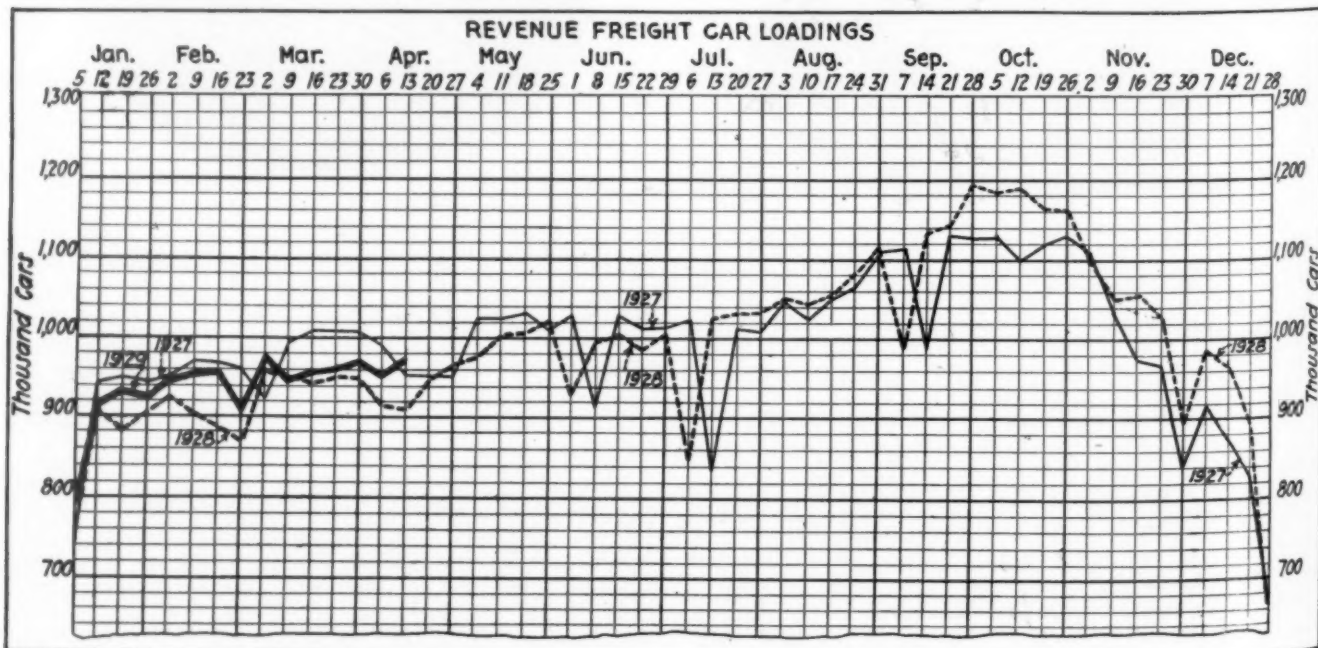
The freight car surplus during the period ended April 8 averaged 271,353 cars, as compared with 279,107 cars on March 31. The total included 134,726 coal cars, 89,107 box cars, 27,564 stock cars, and 11,380 refrigerator cars.

### Car Loading in Canada

Revenue car loadings at stations in Canada for the week ended April 13 totalled 64,256 cars, an increase over the previous week of 835 cars and an increase of 5,297 cars over the same week last year.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada		
April 13, 1929	64,256	44,119
April 6, 1929	63,421	43,580
March 30, 1929	61,452	43,907
April 14, 1928	58,959	37,751
Cumulative Totals for Canada		
April 13, 1929	932,857	648,661
April 14, 1928	932,718	595,329
April 16, 1927	905,573	586,183

UNLESS the New York Central in carrying out its contemplated purpose of brightening its passenger trains, says the New York Herald-Tribune, means to adopt the color schemes in use by automobile manufacturers it will not institute any innovation. Already the Pennsylvania's maroon coaches are known throughout its system. The Chicago, Milwaukee, St. Paul & Pacific runs yellow vestibule trains out of Chicago westward, and a number of other lines operating beyond the Mississippi have discarded the old gloomy black for brighter hues. Recently when the Interborough was seeking to overcome the natural propensity of people to go down stairs for a train rather than up, it painted its elevated cars bright yellow, though with what result it has not yet announced. That railroad officials should discover the lure of color was inevitable in an age when it is spreading to the exteriors of tall buildings, spashing motor buses with most of the hues of the rainbow and blazing from the roofs of suburban villas.





# Union Pacific Earnings Increase

*Ton-miles 8.7 per cent higher but lower rates and passenger decline hold gross down to 5.5 per cent over 1927*

THE Union Pacific System in 1928 had operating revenues of \$215,169,245, an increase of 5.5 per cent over the preceding year. Net operating revenue was \$68,912,757, an increase of 8.4 per cent. Net railway operating income was \$43,818,995, or 11 per cent greater than that for 1927. Other income (mostly from investments) increased 10.4 per cent to a total of \$20,346,558. Fixed charges were \$18,058,681—a slight decrease from 1927. The surplus remaining after dividends on preferred stock was \$42,125,148, representing 18.95 per cent on the common stock, or an improvement of 18 per cent over 1927. Dividends at the rate of 10 per cent were paid—the same as in 1927, and \$19,895,988 was added to the corporate surplus—47.8 per cent more than in the preceding year.

## Increased Operating Efficiency

The improvement from a financial standpoint as shown by these figures is no less marked than the increase in the transportation performance and the efficiency with which it was conducted. Statistics of freight service operating efficiency for 1928 and 1927 with percentage comparisons are given in Table I herewith, showing the three component parts of the Union Pacific System separately.

The Union Pacific Railroad proper, it will be noted, had the largest of the increase, its gross ton-miles being 12.5 per cent and its net ton-miles 10.5 per cent in excess of its 1927 totals. It will be noted that factors entering into this ton-mile performance increased by similar percentages—freight train miles 13 per cent, locomotive-miles 12.6, car-miles 13.8 and freight train hours 10.7. On the other hand, car-miles per car-day increased 13.7 to the high total of 66.3 and net ton-miles per car day rose 10.4 per cent to a total of 911. The percentage of loaded to total car-miles declined 3 per cent, which explains a 2.2 per cent reduction in net tons per train and a minute decrease in net ton-miles per train-hour. Fuel consumption per 1,000 gross ton-miles was improved 1.8 per cent and locomotive-miles per locomotive-day 20.6 per cent.

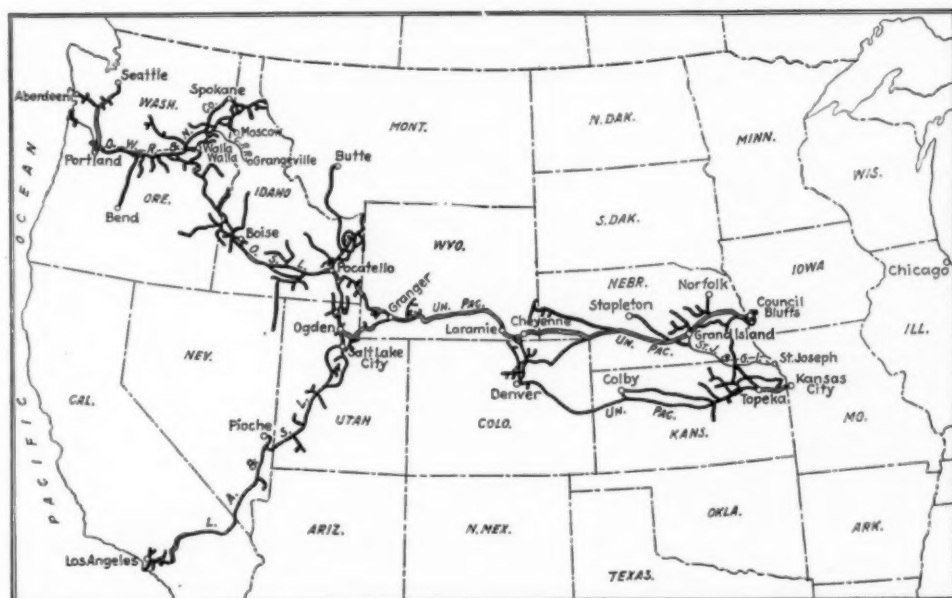
The Oregon-Washington had an increase of 6.8 per cent in gross ton-miles and of 3.7 per cent in net ton-miles which it handled with an increase of only 1.5 per cent in freight train-hours. Train speed increased 2.5 per cent, gross ton-miles per train-hour 5.1 per cent and net ton-miles per train-hour 2.1 per cent. Fuel consumption per 1,000 gross ton-miles declined 2.9 per cent

and locomotive-miles per locomotive-day increased 10.3 per cent.

On the Los Angeles & Salt Lake gross ton-miles were virtually unchanged while net ton-miles declined 1.7 per cent. The management was able, however, to effect a decrease of 2.3 per cent in train-miles and in locomotive-miles and of 8.8 per cent in train-hours. Car-miles per car-day increased 11.5 per cent to a total of 43.6 and net ton-miles per car-day totaled 621, an increase of 8.6 per cent. Gross ton-miles per train hour showed an improvement of 10.2 per cent and net ton-miles per train-hour 7.8 per cent. Fuel consumption per 1,000 gross ton-miles declined 3.5 per cent.

## Great Diversification in Traffic

The freight tonnage of the Union Pacific in 1928 was divided among the various classifications of commodities as follows: Agricultural products, 28.76 per cent; animal products, 4.54 per cent; products of mines, 28.24 per cent (coal, 15.46 per cent); forest products, 15.51 per cent; manufactured goods, 20.69 per cent; and l.c.l.,



The Union Pacific System

2.26 per cent. The wide diversification of its traffic is evident, as is also the emphasis on the higher grades of traffic which explains the ton-mile earnings figure—1.168 cents in 1928—and the relatively lower average load per car—22.22 tons in 1928—which would be much higher if products of mines figured to a larger degree in total tonnage.

The company's expenditures for additions and betterments during the past six years compare as follows:

	Extensions	Roadway	Equipment
1923	\$2,470,610	\$16,248,072	\$12,056,876
1924	4,663,270	10,124,108	6,331,424
1925	2,160,441	7,010,549	4,058,039
1926	1,003,391	9,138,409	10,184,648
1927	354,746	9,622,575	2,966,774
1928	2,292,029	8,491,756	6,029,755

In 1927 and 1928 the principal expenditures for improvements to roadway and structures included the following projects: Numerous water service improvements, including a large concrete reservoir at Laramie, Wyo., enlargement of tourist accommodations at several national parks; installation of color light signals from Fort Hall, Idaho, to Idaho Falls, 37 miles; construction of 28.2 miles of second main track; installation of 395 miles of automatic signals between Lynndyl, Utah, and Thomas and between Farrier, Nev., and Daggett, Calif.; a great many bridge renewals; large extensions to telegraph and telephone service. The North Platte cut-off, 54 miles in length, between Egbert, Wyo., and Creighton, was placed in service in September, 1928.

The company laid 232.6 track miles of new steel rails in 1928 as compared with 282.1 in 1927. Ties used in track maintenance in 1928 totaled 2,645,731 (98.3 per cent treated), equivalent to 6.8 per cent of all ties in track. In 1927 a total of 2,797,799 ties were used, equivalent to 7.2 per cent of all ties in track.

#### Additions to Equipment

Additions and betterments to equipment in 1928 included 23 new locomotives, 500 freight cars and 42 passenger train cars. In 1927 equipment purchases included 100 freight cars and 53 passenger cars.

At the end of 1923 the Union Pacific System had 1246 freight locomotives with an average tractive effort of 47,694 lb. At the end of 1928 the total number had been reduced to 1044, but the average tractive effort had increased 15.7 per cent to an average of 55,198 lb. The change which has taken place in the character of

the motive power in use on the system in this period is striking, as the following tabular chart prepared from the annual reports of the two years, shows.

Type	No. Owned Dec. 31, 1928	Avg. Tractive Force Lb.	No. Owned Dec. 31, 1928	Avg. Tractive Force Lb.
0-6-0	263	30,001	217	30,651
0-8-0	...	...	1	39,458
4-4-0	29	16,947	8	15,018
4-6-0	245	26,564	85	29,045
4-8-0	15	40,127	...	...
4-4-2	35	23,425	12	23,408
4-6-2	209	33,529	193	35,289
4-8-2	55	54,838	60	54,838
4-10-2	...	...	10	78,000
4-12-2	...	...	38	100,201
2-6-0	16	24,341	...	...
2-8-0	530	40,854	494	41,530
2-8-2 (Pass)	185	51,848	362	50,983
2-8-2 (fgt)	177	49,346	...	...
2-10-2	134	70,450	144	72,127
2-8-8-0	47	103,000	70	106,176
2-8-8-2	9	97,507	...	...
Shay	2	27,500	2	27,500
Nar. Gage	4	...	4	...

The operating ratio of the Union Pacific System in 1928 was 67.97, both maintenance of way expenses and maintenance of equipment expenses having increased but 0.9 per cent and 40.4 per cent respectively as compared with an increase in operating revenues of 5.5 per cent. Transportation expenses (rail line) increased 5.7 per cent, which is accounted for by the increase in business and also by increases in wage rates which amounted to \$1,450,000.

#### 8.7 Per Cent More Traffic Revenue

Increases Only 5.5

The increase in operating revenues on the system in 1928—5.5 per cent—is accounted for by an increase of 7.5 per cent in freight revenue. Passenger revenue

Table I—Union Pacific System—Comparison of Selected Freight Operating Statistics

	Union Pacific			O. W. R. R. & N.			L. A. & S. L.		
	1928	1927	Per cent of change	1928	1927	Per cent of change	1928	1927	Per cent of change
Mileage operated	3,732	3,713	+ 0.5	2,247	2,157	+ 4.2	1,200	1,199	...
Gross ton-miles (thousands)	29,101,509	25,870,215	+12.5	4,298,591	4,024,441	+ 6.8	3,683,434	3,666,353	+ 0.5
Net ton-miles (thousands)	13,609,971	9,597,597	+10.5	1,927,605	1,858,718	+ 3.7	1,396,220	1,420,522	- 1.7
Freight train-miles (thousands)	13,759	12,176	+13.0	2,500	2,393	+ 4.5	2,115	2,167	- 2.3
Freight locomotive-miles (thousands)	14,821	13,159	+12.6	2,832	2,711	+ 4.5	2,582	2,645	- 2.3
Freight car-miles (thousands)	772,027	678,485	+13.8	106,089	97,749	+ 8.5	98,021	97,219	+ 0.8
Freight train-hours	797,330	719,992	+10.7	200,960	197,792	+ 1.5	161,547	177,207	- 8.8
Car-miles per day	66.3	58.3	+13.7	23.9	22.3	+ 7.2	43.6	39.1	+11.5
Net tons per loaded car	20.9	20.8	+ 0.4	26.2	26.5	- 1.1	22.4	22.8	- 1.8
Per cent loaded to total car-miles	65.9	67.9	- 3.0	69.5	71.7	- 3.1	63.5	64.1	- 0.5
Net ton-miles per car-day	911	825	+10.4	433	425	+ 1.9	621	572	+ 8.6
Freight cars per train	57.0	56.6	+ 0.8	43.4	41.8	+ 3.8	47.6	46.1	+ 3.3
Gross tons per train	2,115	2,125	- 0.5	1,719	1,682	+ 2.2	1,741	1,692	+ 2.9
Net tons per train	771	788	- 2.2	771	777	- 0.8	660	656	+ 0.6
Train speed, miles per train-hour	17.3	16.9	+ 2.4	12.4	12.1	+ 2.5	13.1	12.2	+ 7.4
Gross ton-miles per train-hour	36,499	35,931	+ 1.6	21,390	20,347	+ 5.1	22,801	20,690	+10.2
Net ton-miles per train-hour	13,307	13,330	- 0.2	9,592	9,397	+ 2.1	8,646	8,021	+ 7.8
Lb. coal per 1,000 gross ton-miles	108	110	- 1.8	168	173	- 2.9	139	144	- 3.5
Loco.-miles per loco.-day	86.5	72.7	+20.6	53.7	48.7	+10.3	55.8	58.2	- 4.1
Per cent freight locos. unserviceable	10.2	9.0	+13.3	10.3	10.8	- 4.6	6.6	6.7	- 1.5
Per cent freight cars unserviceable	9.8	11.0	-11.0	6.2	4.8	+29.1	3.2	3.3	- 3.0

Table II—Union Pacific, Operating Results, Selected Items

	Years 1920 to 1928.								
	1920	1921	1922	1923	1924	1925	1926	1927	1928
Average mileage operated.....	8,192	8,205	9,406	9,483	9,510	9,548	9,647	9,676	9,813
Total operating revenues.....	\$209,049,510	\$181,445,913	\$192,877,122	\$211,318,465	\$199,035,118	\$198,039,901	\$205,416,264	\$203,891,622	\$215,169,245
Total operating expenses.....	156,939,935	131,601,749	143,846,229	152,249,080	141,611,098	138,842,480	140,769,540	146,334,442	146,256,488
Net operating revenues.....	52,109,576	49,844,164	49,030,892	59,069,385	57,424,020	59,197,421	64,646,723	63,557,180	68,912,757
Railway tax accruals.....	12,086,046	11,720,856	13,251,551	13,573,067	14,457,715	13,462,886	15,725,933	15,985,844	15,978,221
Railway operating income.....	40,014,200	38,084,985	35,766,067	45,474,535	42,936,623	45,719,298	48,906,839	47,554,261	52,924,888
Hire of equipment.....	Dr. 375,107	Dr. 3,839,656	Dr. 1,560,815	Dr. 4,938,152	Dr. 4,274,781	Dr. 4,809,334	Dr. 6,028,220	6,954,515	7,965,912
Net railway operating income.....	39,261,267	33,856,449	33,496,318	39,660,246	37,913,161	40,038,645	42,100,143	39,483,390	43,818,995
Dividends on stock owned.....	4,172,396	4,725,372	7,888,049	9,473,676	8,122,395	8,725,895	8,893,880	10,276,593	11,369,984
Interest on bonds owned.....	7,331,211	7,564,737	6,156,427	6,008,541	6,433,990	6,103,127	5,909,971	6,195,669	6,430,397
Total other income.....	12,298,957	13,138,088	15,749,563	17,513,567	16,226,202	16,539,698	17,129,664	18,435,629	20,346,558
Gross income.....	48,261,218	47,364,255	49,245,880	57,173,812	54,139,363	56,578,343	59,229,807	57,919,019	64,165,553
Interest on funded debt.....	15,419,279	15,914,445	16,430,877	16,879,477	17,855,927	17,884,893	17,794,134	17,744,850	17,573,934
Total deductions.....	15,586,987	16,063,180	16,906,157	17,251,606	18,386,159	18,347,283	18,245,057	18,253,784	18,058,681
Net income.....	32,674,231	31,301,075	32,339,723	39,922,206	35,753,205	38,231,060	40,984,749	39,665,235	46,106,872
Preferred dividends (4%).....	3,981,740	3,981,740	3,981,740	3,981,740	3,981,740	3,981,740	3,981,740	3,981,740	3,981,740
Common dividends—rate.....	10	10	10	10	10	10	10	10	10
Common dividends—amount.....	\$22,229,160	\$22,229,160	\$22,229,160	\$22,229,160	\$22,229,160	\$22,229,160	\$22,229,160	\$22,229,160	\$22,229,160
Earnings per share on common.....	\$12.90	\$12.29	\$12.75	\$16.16	\$14.29	\$15.40	\$16.64	\$16.05	\$18.95
Total revenue tons.....	28,320,410	23,255,922	27,171,043	30,820,137	31,503,788	32,770,901	34,534,148	34,785,587	35,717,820
Revenue ton-miles (thousands).....	12,882,042	8,904,692	10,533,713	11,916,698	11,786,736	12,444,146	13,211,550	13,157,043	14,301,827
Rev. passenger-miles (thousands).....	1,308,588	956,698	1,056,202	1,142,849	1,057,149	1,050,052	983,164	931,033	889,651
Revenue per ton per mile (cents).....	1.141	1.451	1.315	1.285	1.233	1.188	1.178	1.181	1.168
Average haul.....	454.87	382.90	387.68	386.65	374.14	379.73	382.56	378.23	400.41
Operating ratio.....	75.07	72.53	74.58	72.05	71.15	70.11	68.53	68.83	67.97

NOTE:—Los Angeles & Salt Lake included beginning in 1922.



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declined 5.5 per cent. In order to receive the 7.5 per cent increase in freight revenue the company carried 8.7 per cent more net ton-miles than it did in the preceding year. This increased performance was, however, in part offset by a decline of 1.1 per cent in the average revenue per ton-mile and was still further offset by the chronic decline in passenger business. The increase in freight business was attributable to heavier shipments of grain, fresh fruits and vegetables, manufactured goods (particularly automobiles), lumber, non-ferrous metals and petroleum products.

The Union Pacific System at the end of 1928 had a corporate surplus of \$234,922,375, as compared with outstanding capital stock of \$222,293,100, preferred stock of \$99,543,100 and funded debt of \$409,356,215. Of total assets of \$1,203,714,864, it had an investment in road and equipment of \$861,330,313, investments in non-affiliated companies of \$172,365,144 and in United States government bonds, \$32,013,361.

## Emergency Board Reports on Texas & Pacific Dispute

WASHINGTON, D. C.

**A** FINDING that the Texas & Pacific should share equally with its train employees the loss to the employees involved in the depreciation in the market value of their homes due to the removal of the company's terminals from Longview Junction to Mineola, Tex., and from Marshall, Tex., to Shreveport, La., is expressed by the emergency board appointed by President Hoover to investigate a dispute between the company and certain of its employees which had resulted in the calling of a strike.

The board conceded that the carrier is under no legal or contractual liability to compensate the employees for the loss and that the weight of precedent is against it but it expressed the opinion that it is not fair for the carrier to reap the entire benefit from the change in terminals and the employees be compelled to bear the entire loss.

The report of the board, of which J. R. Garfield was chairman, was made public at the White House on April 24 after it had conducted hearings at Dallas, Tex., from April 10 to April 20. After reviewing the history of the controversy the board reported that during the progress of the hearings three of the seven cases in dispute had been disposed of by agreement between the carrier and its employees and it submitted its findings and conclusions as to cases 2, 5, 6 and 7 in part as follows:

### Findings and Conclusions

#### CASE NO. 2

The chief cause for the dispute existing between the carrier and the employees grows out of the claims of the employees for compensation for property losses which it is alleged the employees who have homes at Longview and Marshall will suffer by reason of the change of terminals to Mineola and the necessary removal of their homes to that point.

In this case, in which the employees are seeking compensation for the depreciation in the market value of their homes due to the change of terminals, it may be conceded that the carrier is under no legal nor contractual liability. It may also be conceded that the payment of compensation is not a policy generally sanctioned by custom, and that the weight of precedent is against it. However, it has been recognized in a particular instance in an Act of Congress. It has been applied by three carriers where the amount involved was not large. It is

proper, however, to observe that in one instance the carrier was interested in the town site company that sold the lots. That case is distinguishable by the fact that the carrier owned the lots, induced the employees to purchase and then destroyed the value of the property sold. The principle has been definitely adopted in Canada by Act of Parliament. But after all the fact that a thing has not often been done is no reason why it should not be done, if it be sound in principle and necessary to meet the demands of justice and fair dealing. Carriers are public service corporations in the broad meaning of those words. They are subject to governmental regulation and control. The acts of Congress contemplate efficiency of service, fair treatment of employees and a reasonable return to stockholders. In other words there is a community of interest between the public, the stockholders and the employees that must not be overlooked.

The train and engine service employees are in a class by themselves. They must heed the call of the road and move when a terminal is changed, and the character of their employment is such that their opportunities to enter other fields are limited. These men are encouraged to buy their homes. Such ownership strengthens their moral fibre, makes them better citizens, and adds to their efficiency.

The change from Longview Junction to Mineola and from Marshall to Shreveport will result in a substantial saving for the carrier. It is not fair, we think, that the carrier reap the entire benefit and that the employees be compelled to bear the entire loss.

But the question recurs: How shall the loss be apportioned? It is impossible to lay down a rule applicable to every situation. Here the terminals were changed for two purposes; (1) efficiency, (2) economy. Ordinarily a change made for efficiency is a risk naturally incident to the employment and in this respect, the case for compensation is not so clear. But as before stated a loss due to a change, made in the interest of economy, should not fall on the employees alone.

We are therefore constrained to the view that in the circumstances here presented the loss should be borne equally by the carrier and the employees. The loss is the depreciation in the market value of the property involved, due solely to the change of terminal and to no other factor. The measure of depreciation is the difference between the market value of the property just before it became generally known that the terminal would be moved, and the market value immediately after removal.

In announcing this principle, we confine its application to the engineers, firemen, conductors, brakemen and baggagemen, here involved, who are required by the conditions of the service, to move their homes. It does not apply to employees who leave or are dismissed from the service. We further confine its application to actual homes of the said classes of employees, of the usual and customary size and character in the town of their location. It does not apply to any lots of unusual size or to any property held or used for mere investment. We are further of the opinion that the claims arising in this case should be settled in conference, or in case of disagreement, by arbitration in the following manner: Three competent, disinterested men, none of whom live in Longview or Marshall, shall compose the arbitration board. One of them shall be selected by the carrier and one by the employees affected or their representatives. The two thus selected shall select the third. If such selection is not agreed upon within ten days, the third person shall be selected by the Chairman of the U. S. Board of Mediation.

#### CASE NO. 5.

The facts regarding this dispute are: The general practice during many years has been not to pool cabooses in freight service except under emergency situations. With the establishment of the Mineola terminal the carrier announced the pooling of cabooses on freight runs through Mineola, but assigning such cabooses to the crews for occupancy at away from home terminals.

The employees maintain that this change is a violation of a general rule adopted by agreement between the carrier and employees in 1915 and evidenced by certain letters, dated July 22, 1915, copies of which were presented to the Board. The carrier, while not denying the authenticity of the letters, questions the authority of the person over whose name the letters were issued so to bind the carrier.

From all the corroborative evidence presented and the proof of uniform practice in conformity with the terms of agreement expressed in the letter, we find the agreement as claimed by the employees is in force and that pooling of cabooses, except in emergencies, should not be made other than by agreement be-

tween the parties or by a change of the rule in accordance with the usual procedure governing the change of rules.

#### CASE NO. 6.

The facts regarding the assignment of passenger engine crews on the Fort Worth-Texarkana runs are:

Prior to the establishment of the Mineola Terminal passenger engine crews ran from Fort Worth to Longview Junction, a distance of 159 miles, and from Longview Junction to Texarkana, a distance of 90 miles. On January 17, 1929, when the terminals were moved from Longview to Mineola, the engine crews on the passenger runs were notified that their runs would be extended from Fort Worth to Texarkana, a distance of 249 miles, and from Texarkana to Fort Worth, thus eliminating the break at Longview Junction.

The employees maintain that the run of 249 miles is excessive; that the running time on said runs is from 6 hours and 15 minutes on the fastest runs to nine hours and 15 minutes on the slowest. This running time does not include the 1 hour and 20 minutes for calling and preparation.

The carrier maintains that by reason of the fact that the main line between Fort Worth and Texarkana has been rebuilt, equipped with electric blocks, heavier engines, heavier rails and better roadbed, the distance of 249 miles is not excessive in view of the elapsed running time. Evidence was introduced regarding the length of runs and working conditions on other roads. The board is convinced that the run is excessive and should be abolished.

The carrier urges that if it be abolished, the break in the run should be made at the new terminal at Mineola rather than at the old terminal, Longview. With this contention the board is in sympathy even though it necessitates the removal of the engineers and firemen, now operating these runs, from Longview to Mineola.

#### CASE NO. 7.

The facts regarding the request of the employees that the seniority rules and schedules of the carrier be applied to the five subsidiary lines are:

These five railroad corporations are corporations organized under the laws of the State of Texas and are not and cannot, under the laws of the State, be consolidated with the carrier. Their corporate entity must be maintained although the stock of those corporations is and can legally be owned by the Texas & Pacific Railway Company.

From the testimony presented it is clear that these lines are not branch lines and cannot legally be so considered although, through the stock ownership by the Texas & Pacific, the Texas & Pacific elects the boards of directors who control each of said subsidiary lines. The president of the Texas & Pacific is also the president of each of these companies, but other officers are different.

These lines are short and the methods of operation are very different from the business and operation upon the main line of the carrier. In one instance—that of the Pecos Valley & Southern—the regular motive power is a converted motor truck operated by an engineer who is, in fact, merely a chauffeur. There are occasions when a steam locomotive is used for freight service.

The employees maintain that these subsidiary lines are, in fact, branch lines and that the carrier should be compelled to negotiate rates of pay, working conditions and seniority rights in accordance with the terms of the agreements between the employees and the carrier, using the Texas & Pacific schedules and rates as a basis of the negotiations and making certain modifications in those schedules and rates in order to meet the special operating and physical conditions upon the subsidiary lines.

The carrier maintains that the subsidiary lines and the employees upon those lines should be governed by the agreements made between the representatives of those lines and their employees or their representatives, admitting that the representatives of the employees appearing in this case are and will be recognized as the representatives of the employees upon the subsidiary lines.

The board is of the opinion that the contention of the carrier

is correct, and that all matters in dispute between the employees on the subsidiary lines and the managers of those lines, should be negotiated, using the existing rates and schedules and operating rules as a basis for any modifications or changes that may be requested by the employees or their representatives, or by the managers of the subsidiary lines.

## Spring Switches Used on I. C.

By H. G. Morgan

Signal Engineer, Illinois Central

THREE tunnels are located in a short section of the new single-track freight line of the Illinois Central in Southern Illinois, and sidings are located between tunnel No. 1 and tunnel No. 2 and between tunnel No. 2 and tunnel No. 3. Color-light signals are in service, and three spring switches have been employed to improve operation in this territory. The track and signal arrangement is shown in the diagram.

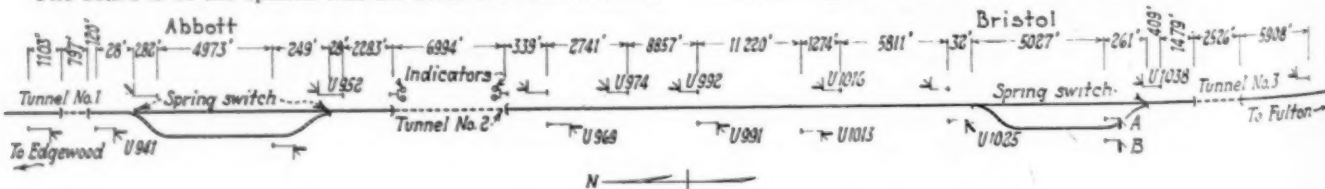
The siding at Abbott takes all the available space outside the rock cuts approaching tunnels No. 1 and No. 2. Number 18 turnouts are provided at the ends of this siding, both of which are equipped with spring switches, so connected as to, in effect, produce a short piece of double track by diverting all southbound trains through the siding.

The south end of the siding at Bristol is provided with a spring switch, so that trains leaving the siding will not have to stop in the tunnel while the switch is being restored to normal position for main line movements. A special circuit is used in connection with the signals at this location.

Signals A and B, governing southward movements over the spring switch, both normally indicate "stop." Trains approaching on the main track, clear signal A, and trains approaching on the siding, clear signal B. Both signals cannot clear at once. If a train is occupying the approach clearing section on the siding, and a train is moving northbound on the main track, signal B will clear as soon as the rear end of the northbound train passes signal A. The arrangement is, therefore, automatic for the usual train movements.

For other movements, two push buttons are provided whereby signal B may be placed at stop, and signal A cleared, or the reverse. For example, if a train has occupied the clearing section on the siding, before a southbound train has reached the clearing section for the main track, it will be necessary for the crew of the train on the siding to push button A, after the southbound train on the main line has entered the clearing section for signal A. This will put signal B at stop and clear signal A.

For the protection of the signal maintainers in operating an insulated motor car through the 6,994-ft. tunnel, an indicator with a push button is located at each portal, so that the men may know whether a train is approaching from either direction before entering the tunnel. Gas masks are provided for these men when it is necessary for them to work inside the tunnels.



Track and Signal Plan, Showing Spring Switches and Special Signals



# E. F. Carry, Pullman President, Dies Suddenly

*Head of company since 1912, he saw great increase in business  
and in efficiency of its operations—A leading figure  
in railway equipment and supply field*

EDWARD F. CARRY, president and a director of Pullman, Inc., Chicago, and its subsidiary, the Pullman Company, died suddenly in that city on April 24 from cerebral embolism. Although his health had been failing for some time he had continued to work in his office until a few days before his death.

Mr. Carry, who had long been recognized as one of the leading figures in the railway equipment and supply industry, had been president of the Pullman Company since 1922, and the period of his administration was one during which the business of that company expanded greatly and marked changes were made in its corporate structure. Some idea of the progress made by the Pullman Company under his generalship is indicated by the increase in its operations. Thus the total car miles increased from 890,719,000 in 1923 to 1,153,889,000 in 1928, and the revenue from cars increased from \$73,683,000 in 1923 to \$82,249,000 in 1928. The increase in operating efficiency during this period is indicated by the fact that the average mileage per car operated increased from 122,567 in 1923 to 133,691 in 1928, and the average miles per car per day from 336 in 1923 to 365 in 1928.

In 1924 Mr. Carry saw the need for the segregation of the manufacturing departments from those of the operating departments and organized the Pullman Car & Manufacturing Corporation, which has since been operated as a separate unit. In 1927 the operations of the Pullman interests had increased to such an extent as to demand a further modification of the corporate structure. This took the form of the creation of Pullman, Inc., a holding company to direct the affairs of the manufacturing and carrier companies as a whole, while permitting of a more complete financial segregation of those operations subject to public regulation.

Under the new corporate structure the assets of the Pullman Company which are not essential to its car-

rier activities could be utilized for the benefit of the stockholders of the Pullman Company more advantageously in broadening the scope of its corporate activities than could be done under the old corporate structure.

During the war Mr. Carry took a prominent part in the emergency transportation work, serving as vice-chairman of the Shipbuilding Labor Adjustment Board in September, 1917; director of operations of the United States Shipping Board from September, 1917, to October, 1918; trustee of the Emergency Fleet Corporation from August, 1918, to January, 1919; and chairman of the Port and Harbor Facilities Committee of the United States Shipping Board from May, 1918, to January, 1919.

In addition to his connections with the Pullman Company, Mr. Carry was a director of the Atlas Portland Cement Company, the Continental Illinois Bank & Trust Company, Montgomery, Ward & Company, the Electric Household Utilities Corporation, the Pullman Trust & Savings Bank, the Guaranty Trust Company of New York, and the Chrobaltic Tool Company.

## Born in Fort Wayne, Ind.

Edward Francis Carry was born on May 16, 1867, at Fort Wayne, Ind., and began his business career with the Wells & French Car Company, Chicago, in 1888. He was secretary of this company at the time of its consolidation with the American Car &

Foundry Company in 1899. He served the latter company for 28 years as district manager, third vice-president, second vice-president, and later as first vice-president and general manager, from which position he resigned in 1916 to become president of the Haskell & Barker Car Company. In 1922, when that company was purchased by the Pullman Company, Mr. Carry was elected president, the position he held until his death.



Edward F. Carry

# Rates Via Barge Line Prescribed

*I. C. C. requires rail lines to make joint traffic arrangements with Waterways Corporation*

**E**STABLISHMENT of through routes and joint rates between the Inland Waterways Corporation barge lines and all connecting common carriers by rail subject to the interstate commerce act and their rail connections, subject to restrictions to prevent unduly circuitous routes, is required by the Interstate Commerce Commission in a decision made public on April 20 in Ex Parte No. 96, on the application filed by the waterways corporation pursuant to the Denison amendment of the waterways act of May 29, 1928.

Bases for making the through rates by deducting minimum differentials from the all-rail rates, generally 20 per cent are also prescribed, but the question of division of the through rates between the rail lines and the barge line is left to negotiations between them to begin within 30 days after the rates become effective, the results to be reported to the commission after 120 days. The through routes and rates are to be established by August 27.

As a prerequisite to the issuance of the order the commission issued a certificate that public convenience and necessity require the operation of the Inland Waterways Corporation as a common carrier on the Mississippi, Black Warrior, Warrior, Tombigbee and Mobile rivers, between the termini and ports of call set forth in the report.

The majority report is by Commissioner Eastman and contains little discussion of the principles involved, but it is stated that a number of very circuitous routes are included in the barge line proposals as well as a number of instances where the barge haul is relatively so short, as compared with the total distance, as to raise grave doubt whether the cost of transportation is not in fact greater over such route than over the direct all-rail route and that the commission cannot require the establishment of all which are proposed.

There was no dissent among the commissioners but Commissioner Woodlock, in a concurring opinion, pointed out that the commission is merely complying with a positive mandate of Congress and said that the public should understand that what is being done is an experiment and that its results should be closely observed so that appropriate action may be taken in accordance with the results. As to the level of the rates and the differential, he said, the commission is continuing a relic of the war without knowing whether the rates proposed are too high or too low.

Committees representing the railroads have been in conference for some time with the officers of the waterways corporation in an effort to work out joint routes, rates and divisions without recourse to litigation but little has been made public as to the progress that has been made.

The report points out that practically all of the rail carriers and most of those by water subject to the interstate commerce act were named in the petition of the waterways corporation and that it had subdivided the United States into 46 arbitrary groups and set forth 69 instances in which it desired through rates between one or more of such groups and other groups, the ports of call via which it proposed that the rates should apply

and the bases for the maximum differentials which it wished the commission to fix. Following are the essential parts of the majority report and of the concurring report by Commissioner Woodlock:

## Differentials Proposed

In a few instances the proposals ask for joint rates on particular commodities, but in most cases the application seeks rates on all "classes and commodities" without regard to whether or not any particular kind of freight is or is not susceptible of transportation by the barge line. In nearly all instances it is proposed to construct the joint barge-rail and rail-barge-rail rates by deducting from the "all-rail rates" between the same points differentials equivalent to 20 per cent of the all-rail rates contemporaneously effective on like traffic between the ports between which it is proposed that the traffic shall move by barge. In a few instances it is proposed to deduct 20 per cent of the all-rail rates between St. Louis and a lower Mississippi River port when it is proposed to apply the joint rates via Cairo, which proposal would result in differentials under the all-rail rates greater than 20 per cent of the rail rates between the ports via which shipments would be handled by the barge line. The particular rail rates to be used as the basis for the proposed rates are not specified in the application. That is to say, it does not state whether the proposed rates are to be based on the lowest rates applicable over any all-rail route from point of origin to destination or on the rates over the all-rail route operating via the ports at which the traffic would be interchanged between the rail lines and the barge line. Manifestly, however, the purpose of the proposed rates would be to attract traffic to petitioner's line as against the lowest-rated all-rail route. Rates not based on the lowest available all-rail rate would not adequately serve that purpose. It must be inferred, therefore, that it is applicant's desire that the proposed rates shall be based on the lowest all-rail rate from point of origin to destination, and the application will be considered on that assumption. \* \* \*

Nevertheless, a number of very circuitous routes are included in the proposals as well as a number of instances where the barge haul is relatively so short, as compared with the total barge-rail or rail-barge-rail distance, as to raise grave doubt whether the cost of transportation is not in fact greater over such route than over the direct all-rail route. For example, the application proposes a first-class rate of \$1.42 from Bristol, Tenn., to Meridian, Miss., via rail lines to Memphis, thence via the barge line to Vicksburg and thence via rail lines beyond. This is the rate prescribed in the southern class-rate revision for all-rail hauls of 381 to 400 miles in southern territory. The short-line all-rail distance from Bristol to Meridian is 538 miles, whereas the short-line all-rail distance is 555 miles from Bristol to Memphis, and 915 miles from Bristol to Meridian via Memphis and Vicksburg. The all-rail route through the ports via which it is proposed to apply the rail-barge-rail rate is thus 70 per cent longer than the direct all-rail route. The all-rail first-class rate from Bristol to Memphis is \$1.66, whereas under the proposal the rate covering not only this haul but also transportation by barge from Memphis to Vicksburg and by rail from Vicksburg to Meridian, in addition to two transfers between barge and rail, would be 24 cents less. The combined rail distance from Bristol to Memphis and from Vicksburg to Meridian is 695 miles. The first-class rate for that distance in southern territory is \$1.87. This may be contrasted with the \$1.42 which it is proposed to charge for this rail haul plus the water haul between Memphis and Vicksburg and two transfers between barge and rail.

Our power to require through routes and joint rates in connection with the barge line is limited, as found in *Procedure under Barge Line Act, supra*, to cases where we deem such rates and routes to be necessary or desirable in the public interest, and the differentials prescribed must be reasonable. Manifestly we can not here consider in detail each of the thousands of proposed routes and differentials. Neither can we require the establishment of all which are proposed, in view of the fact that many of them are neither necessary nor desir-

WASHINGTON, D. C.



able in the public interest. We must, therefore, adopt general rules or bases for routes, rates, and differentials that will be in substantial accord with the intent of the law as we understand that intent.

In a number of cases we have considered petitions of the barge line for establishment of through routes and joint rates in connection with rail carriers, among others *U. S. War Department v. A. & S. Ry. Co.*, 77 I. C. C. 317, 92 I. C. C. 528; *U. S. War Department v. Abilene & S. Ry. Co.*, 151 I. C. C. 91; *Inland Waterways Corp. v. Alabama G. S. R. Co.*, 151 I. C. C. 126. \* \* \*

We conclude that in requiring barge-rail routes and rates, we should follow substantially what we did in 151 I. C. C. 126, and that as to rail-barge-rail rates, we should follow 92 I. C. C. 528 with modifications to harmonize with what was thereafter found reasonable with respect to barge-rail rates. Inasmuch as it is our duty under section 2 (e) to prescribe through routes and joint rates immediately after the issuance of a certificate or certificates of public convenience and necessity to the barge line, independent of the filing of any petition by that corporation, our findings will not be confined to routes, rates, and differentials outlined in the application, but barge-rail and rail-barge-rail rates and routes will be required, subject to the limitations set forth, over the lines of all common carriers by rail subject to the act.

There remains for disposition the matter of barge-rail-water rates. This situation may be illustrated by the proposal in the application that through routes and joint rates be required between points in New England, eastern New York, eastern Pennsylvania, and northern New Jersey and points in northern Arkansas via New York, N. Y., thence Southern Pacific Company Steamship Lines to New Orleans, thence barge line to Memphis or Helena, and thence via rail carriers. Between the points of origin and destination described there are, in most instances, at present materially lower rates via ocean-rail routes than apply via all-rail routes. The petition seeks joint rates constructed by deducting from the ocean-rail rates differentials equivalent to 10 per cent of the all-rail rates between New Orleans and Memphis. The only differentials which we may require without hearing are differentials under all-rail rates. There is nothing to show that the establishment of barge-rail-water rates made differentially under the all-rail rates would be of benefit to petitioner or in the public interest. We shall not at this time require the establishment of such rates.

### Findings

1. We are of the opinion and find that the certificates of public convenience and necessity which are sought should be issued to the Inland Waterways Corporation.

2. We are further of the opinion and find that all connecting common carriers by rail subject to the interstate commerce act and their rail connections should be required to establish through routes in connection with the Inland Waterways Corporation from and to all points served by them, except that (a) no barge-rail route need be established where the short-line all-rail distance via the lines of the said rail carriers from point of origin to point of destination through the port of interchange with the barge line exceeds by more than 40 per cent the shortest rail distance between such origin and destination; (b) no rail-barge-rail route need be established where the shortest all-rail distance from point of origin to point of destination through the ports of interchange with the barge line exceeds by more than 33 1/3 per cent the shortest all-rail distance between such origin and destination; (c) no barge-rail route need be established where the shortest all-rail distance between the inland point of origin (or destination, as the case may be) and the port of interchange exceeds three-fourths of the shortest all-rail distance between point of origin and point of destination; (d) no rail-barge-rail route need be established where the sum of the shortest all-rail distance from the point of origin to the port of interchange where the shipment is delivered to the barge line, plus the shortest all-rail distance from the port of interchange where the shipment is relinquished by the barge line to the point of destination exceeds two-thirds of the shortest all-rail distance between origin and destination; and (e) no barge-rail or rail-barge-rail route need be established if an agreement that it shall not be established is reached between the Inland Waterways Corporation and the carriers by rail involved.

In the determination of such through routes, origin and/or destination groups may be used, if the parties so agree, and in that event distances shall be figured from a centrally located point within the group.

3. We are further of the opinion and find that over each of the through routes required in (2) said common carriers by rail in connection with the Inland Waterways Corporation shall

establish joint rates on all classes and commodities constructed by deducting from the lowest all-rail rate contemporaneously applied on corresponding traffic by the said common carriers by rail between point of origin and point of destination via any route the following differentials, which we here find to be reasonable minimum differentials: (a) Where the excess under (a) in "2" above is not more than 20 per cent and the fraction under (c) in "2" above is not greater than two-thirds, and where the excess under (b) in "2" above is not more than 20 per cent and the fraction under (d) in "2" above is not more than one-half, 20 per cent of the lowest corresponding all-rail rate between the ports between which the shipment is transported by the barge line; and (b) in all other cases, 10 per cent of the lowest corresponding all-rail rate between the ports between which the shipment is transported by the barge line; provided, however, that no such joint rate on a commodity need be established if an agreement to the contrary is reached between the Inland Waterways Corporation and the carriers by rail involved, and provided, further, that in the case of joint rates via the port of Birmingham the differentials shall be based upon the lowest corresponding all-rail rates between Birmingham and the port of origin or destination. It should be understood that if the all-rail rates on classes other than first or on commodities are determined by applying percentages to the corresponding first-class rates, the joint rates prescribed in this section may be determined by first ascertaining the barge-rail or rail-barge-rail first-class rate, as the case may be, and applying the appropriate percentage thereto.

4. We are further of the opinion and find that each of the joint rates prescribed in "3" above shall be governed by the same classification and exceptions thereto, and, in so far as the transportation takes place on the lines of the said rail carriers, by the same general and/or special rules, regulations, and practices as govern, apply, or are available in connection with the all-rail rates from which the differentials above are deducted in constructing such joint rates, except that such rules and provisions shall be modified with respect to the acceptance of freight, packing requirements, and the like, in so far as may be necessary to meet the circumstances and conditions of transportation by the barge line.

5. We are further of the opinion and find that the through routes prescribed in "2," the joint rates prescribed in "3" above, and the rules, regulations, practices, etc., prescribed in "4" above shall remain in force until changed by our order or by agreement between the barge line and the rail carriers parties thereto.

6. We are further of the opinion and find that within 30 days after the joint rates prescribed in "3" above become effective, the said common carriers by rail shall enter into negotiations with the barge line for the purpose of agreeing upon equitable divisions of such joint rates; and further, at the expiration of 120 days from the date of publication of the said joint rates, the parties shall advise us in writing as to whether agreement has not been reached between the barge line and said rail carriers with respect to equitable divisions of any of such rates, and if so, the parties shall clearly set forth the rates as to which agreement has not been reached, and shall show the divisions thereof which they consider equitable and their reasons therefor.

An appropriate certificate and order will be entered.

### Commissioner Woodlock's Opinion

WOODLOCK, *Commissioner*, concurring:

It is the intent of Congress, clearly and definitely expressed in the statutes, that water transportation shall be encouraged to the end that the people may derive whatever true economic benefits may inhere therein. It is equally the intent of Congress that our national railroad system shall be preserved in full vigor. There is no necessary economic contradiction between the two intents and both are manifestly "in the public interest." Traffic will move by water only when it is more advantageous so to move it than to move it by rail. In general the inducement must take the form of lower rates. The public is entitled to the lowest rates that water-line carriers can offer, and still make a reasonable profit from the traffic. Whatever business is diverted by such rates from the rail lines is properly so diverted. But if both rail and water lines are to be preserved in full vigor, the total traffic must support both. Neither can properly prey upon the other. Water-line owners can not expect rail-line owners to support them, nor vice versa.

In 151 I. C. C. 126 and 151 I. C. C. 91, and in the instant case, we are making a preliminary insertion of the water lines into our national transportation system. We are here prescribing joint through rail-water rates over a large part of the United States. We are doing it summarily because Congress told us to do it. We do not know whether the level of the rates prescribed is or is not, in fact, the proper level. We

found the differential in existence as a relic of the war and we continue it. It may be too high, or it may be too low; we have not here the evidence on which to determine the question. We take what we find. Further, in prescribing joint rates between rail and water lines, we take what we find and label them maxima. So far we leap in the dark. In prescribing through routes over which these joint rates are to apply, we adopt *faute de mieux* certain broad—but sound—limiting principles so as to preserve at least some degree of consistency with proper economic laws. In so doing, at all events, we are on solid ground.

In all this, however, we are experimenting, and we are doing so under the positive mandate of Congress—which mandate we are assuming to be constitutional—and, therefore, our duty is clear. But the public should understand two things. One is that this is an experiment; and the other is, that its results should be closely observed, so that appropriate action may be taken in accordance with those results. The latter involves a strict scrutiny of two things. One is the operation of the Government-owned Inland Waterways Corporation, to the end that we may be able to determine whether or not it is economically justified. The other is the effect of this operation upon the rail-carrier revenues so that we may be able to determine to what extent they are diminished by the water service. In both cases it is evidence and not propaganda which is required. Divisions between rail and water carriers should be fixed upon the same principles as those which govern divisions between rail carriers. There is no sound economic reason for any other basis.

Subject to these considerations, I concur in the report.

## Waterways Corporation Reports Increased Traffic

WASHINGTON, D. C.

**T**ONNAGE transported by the Mississippi Warrior Service of the Inland Waterways Corporation during the calendar year 1928 amounted to 1,758,244 tons, according to the annual report of Major General T. Q. Ashburn, chairman and executive of the corporation, to the Secretary of War, made public on April 18. The tonnage of the lower Mississippi division was 1,435,560, that of the upper Mississippi division 119,648, and that of the Warrior division 317,389, while 114,353 tons was deducted as having been interchanged between the respective divisions. For 1927 the tonnage of the lower river division was 1,237,452, that of the upper river division 14,061 and that of the Warrior division 398,694.

General Ashburn stated that the corporation had paid all its operating expenses and depreciation and losses incident to the establishment of a new line and had closed the year with a net income from operations of \$373,707. According to the attached report of the secretary-treasurer the book value of the investment of the corporation was \$17,321,574, with a reserve for accrued depreciation of \$1,608,629. He stated the "net profit" for the year at \$257,776, after deducting from the net income the "net expenses" of the Washington office (\$9,520 as against \$65,399 of total expenses) and amounts for loss on property retired and adjustments applicable to prior periods. He also set up a statement of the operations for the period from June 1, 1924, showing a total of \$1,957,082 of "funds derived from operations" after deducting \$2,092,782 for "charges which involved no expenditure of funds," such as the depreciation reserve.

General Ashburn also stated that the total tonnage had been carried at an average revenue of 14 cents per ton less than in 1927 but with reduced expense per ton of 33 cents so that the net operating income of 1928 was 18 cents per ton, as against a net operating deficit

of 1 cent per ton in 1927. He included in his statement an argument as to why the corporation should not show any interest charge for its investment, saying that as it has no bonds what it has left after its charges is a return on the common stock owned by the government.

## Safety Section Meeting

**T**HE ninth annual meeting of the Safety Section of the American Railway Association opened at the Claypool Hotel, Indianapolis, Ind., on April 23, with the largest attendance in its history. At the close of the Wednesday afternoon session, 689 railway men had registered, exceeding the previous high mark of 510 reached at Buffalo, N. Y., in 1928.

D. G. Phillips, superintendent of safety of the Wabash, chairman of the section, in the opening address characterized this meeting as signaling not only satisfactory progress in the reduction of accidents but the definite recognition of supervision and leadership as the most effective means of promoting safety. R. W. Aish-ton, president of the A. R. A., called upon the Safety Section to set a 50 per cent reduction in accidents over 1923 as its goal for 1930 now that the original goal of 35 per cent by that year has been passed by several per cent. Speakers at the meeting who had not previously been announced included H. R. Safford, executive vice-president of the Gulf Coast Lines and the International-Great Northern and vice-president of the Missouri Pacific; H. A. Worcester, vice-president of the Cleveland, Cincinnati, Chicago & St. Louis; J. W. Newell, vice-president of the Wabash; F. T. Singleton, chairman of the Indiana Public Service Commission, and W. H. Cameron, managing director of the National Safety Council. A further report of the meeting will appear in the *Railway Age* of May 4.

## Fire Protection Notes

**T**HE following suggestions are culled from the reports of recent district meetings of members of the Railway Fire Protection Association, R. R. Hackett, (B. & O.) secretary, Baltimore, Md.

The use of acetylene lanterns by car inspectors is regarded as no more hazardous than the use of oil lanterns. Carbide must be kept in a dry place and a special place must be provided for filling lanterns. The residue from lanterns must be isolated so that it cannot become neutralized by the atmosphere.

Fire drills in railroad shops should be held weekly. There should be two fire brigades at each plant so as to promote efficiency by arranging for competition.

Passenger cars in which are operated gasoline engines should have fuel tanks of sufficient capacity to make their usual run; when passengers are ordered out of cars in rainy weather, as a measure of safety while gasoline tanks are being filled, they are likely to complain.

Fires originating from scrap storage batteries can be avoided by thoroughly washing all batteries and plates before transporting them.

Ethylene gas, used in refrigerator cars to improve the color of fruits, introduces a fire risk which should be carefully looked into.

Supply trains delivering gasoline should have a hose to facilitate transferring the gasoline to section houses by gravity. One such hose described is 35 ft. long, all-metal, 1¼ in. in diameter.



## New Books

### Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian,  
Bureau of Railway Economics, Washington, D. C.)

#### Books and Pamphlets

*Annual Report of the Inland Waterways Corporation, Calendar Year 1928*, by Major General T. Q. Ashburn, Chairman and Executive. 49 p. Pub. by U. S. Govt. Print. Off., Washington, D. C., 10 cents.

*Market Data Handbook of New England*, by Edward F. Gerish. Part III of the Commercial Survey of New England issued as Domestic Commerce Series No. 24. Railroad map 1928 and highway map 1928 in pocket on back cover. Described on p. 2-3. 208 p. Pub. by U. S. Govt. Print. Off., Washington, D. C. \$1.75.

*Memorandum on Traffic Surveys*, by R. N. Nicolls. Discusses area, rates, estimations of freight and passenger earnings, basis of operating expenses, capital cost, etc. Technical Paper No. 264 of Govt. of India Railway Board. 37 p. Pub. by Government of India Central Publication Branch, Calcutta, India. Three pence.

*Transcontinental and Intercoastal Trade of the Pacific Southwest in 1926*, by Robert J. McFall. "Railway systems of the southwest" p. 1. "Transcontinental shipments into and out of the Pacific southwest, 1926" p. 7. "Movement of special car-lot express forwarded from California" p. 11. "Transcontinental rail and water shipments of commodities to Pacific southwest" p. 13. "Transcontinental rail and water shipments of commodities from the Pacific southwest" p. 60. Domestic Commerce Series No. 25. 95 p. Pub. by U. S. Govt. Print. Off., Washington, D. C. 25 cents.

#### Periodical Articles

*The Administration of Transport Undertakings—Organization*, by Frank Pick. "I shall aim at inducing you to look at this problem of organization from without, forgetting for the moment that in your daily life you form a unit in its complexity", p. 298. "One thing cannot be organized and that is imagination. Yet one thing there must be in every organization and that again is imagination." p. 307. *Journal of the Institute of Transport*, April 1929, p. 298-307.

*Cornish Broccoli for the Continent*. The international aspects of modern transportation are no more strikingly evident than in the distances between the places where food-stuffs are grown and where they are eaten. Here is one of the latest developments. "The first train-ferry wagon left Penzance for Brussels on February 26." *Modern Transport*, April 6, 1929, p. 9.

*J. Snowden Bell*, by Charles B. Chaney. "In his passing the railroad world has lost a noble member of the profession—doubtless the last railroad mechanical engineer whose actual knowledge and experience extended from the days prior to the Civil War down to the present time." *Baldwin Locomotives*, April 1929, p. 18-19.

*Federal Regulation of Railway Securities*, by John H. Fredrick. Results of certain provisions of Transportation Act 1920. *Journal of Political Economy*, April 1929, p. 175-202.

*German Combined Air-and-Rail Passenger Service*, by A. Douglas Cook. Latest developments including new terms developed. *Commerce Reports*, April 22, 1929, p. 237-238.

*Should We Have a Thirteen Month Year?* History of the calendar, the proposed changes debated pro and con, and provisions of the Porter resolution. *Congressional Digest*, April 1929, p. 98-128.

## Looking Backward

### Fifty Years Ago

The Chicago, Milwaukee & St. Paul, while only increasing the mileage of lines owned by 7 per cent in 1878, as compared with 1877, increased the number of tons of freight carried one mile from 271,598,133 in 1877 to 321,818,902 in 1878 or more than 18 per cent.—*Railway Age*, April 24, 1879.

The Gulf, Colorado & Santa Fe, which extends from Galveston, Tex., to Richmond, 60 miles, was sold at Galveston on April 15 under a trust deed for \$250,000 given to secure a loan. The road was bought for \$200,000 by a syndicate of Galveston merchants and at the sale it was intimated that further extension of the line would be undertaken.—*Railroad Gazette*, April 25, 1879.

A citation of the difference in freight rates in Mexico and the United States offers one of the best arguments with which to combat the efforts of those who declare that the railways are oppressing the people of this country. The rate on first class freight from Vera Cruz to Mexico City, 263 miles, is \$76.05 per ton, or \$3.60 per hundred, while from Chicago to Kansas City, about 500 miles, the present extortionate tariff is 10 cents per hundred pounds.—*Railway Age*, April 24, 1879.

### Twenty-Five Years Ago

James E. Gorman, general freight agent of the Atchison, Topeka & Santa Fe, has been promoted to assistant freight traffic manager, with headquarters at Chicago.—*Railroad Gazette*, April 29, 1904.

The effect of the new law in Michigan for the taxation of railway property is shown by the comparison of the taxes paid by the Grand Rapids & Indiana, (now part of the Pennsylvania) in 1903 and 1902. In 1902 this railway system paid \$100,761 in taxes while last year they had been increased to \$202,939, or 101 per cent.—*Railway Age*, April 29, 1904.

The Ontario Parliament, after a long debate and much opposition, has voted to guarantee a loan of \$2,000,000 to secure the completion of the Algoma Central to a connection with the Canadian Pacific. The railway, of which 80 miles are completed and 240 are still to be constructed, is one of the numerous properties involved in the failure of the Consolidated Superproperties Company, which owned extensive manufacturing, land and steamship interests in the vicinity of Sault Sainte Marie.—*Railway Age*, April 29, 1904.

### Ten Years Ago

R. V. Fletcher, general attorney of the Illinois Central, has been appointed assistant general counsel of the Railroad Administration, in charge of traffic matters.—*Railway Age*, April 25, 1919.

Practically all of the 800 locomotives that have been used during the past year on railroads other than those of their owners, in accordance with the Railroad Administration's plan of pooling facilities, have now been returned to their home roads or are in repair shops on their way home.—*Railway Age*, April 25, 1919.

A statement compiled by the Operating Statistics section of the Railroad Administration shows that the average daily compensation of railway employees whose wages were reported by the day in December, 1917, was \$3.52 and in January, 1919, it was \$4.83. During the same period the average hourly wage rose from 34 cents to 51 cents, or an average weighted increase of 48 per cent. The average daily compensation of general officers receiving over \$3,000 per year shows a decrease of 20 per cent, while the average for those paid less than \$3,000 per year has increased 17 per cent.—*Railway Age*, April 25, 1919.

## Odds and Ends of Railroading

Earle Watkin, machinist at Knoxville, is another of the Southern's radio artists. For the past several months, he has sung over various radio stations an average of more than twice a week.

### The Wonders of Science

The progress of modern medical science cost a western railway \$1,500 the other day, and also fixed the value of excess flesh at \$18.50 a pound. Mrs. Elsie Rea, the plaintiff, was awarded the damages, because she claimed to have injured her pituitary gland in such a way, by falling off a train, as to cause her weight to increase from 145 lb. to 225 lb.

### A Permanent Job

When the Pensacola division of the Louisville & Nashville was formed in 1881, E. O. Saltmarsh was made superintendent. He is the only superintendent that division has ever had in the 48 years of its existence. Recently, on his 80th birthday, the employees of the Pensacola division presented Superintendent Saltmarsh with an automobile in token of their appreciation.

### Another Model Builder

Major Segrave, the British sportsman, who recently broke the world's auto speed record by driving his car nearly 250 miles an hour on a Florida beach, is a railway model addict. He has, on his estate near London, one of the most elaborate toy railways in the world. An American friend recently presented him with a miniature locomotive which cost \$2,000, thus bringing his total of locomotives to 14. He has a large supply of coaches, sleeping cars and freight cars, many of which he built himself. Major Segrave has spent 14 years assembling his railway system and the machinery with which to run it.

### Artistry in Passenger Cars

Beige, biscay green, apple green, fawn and smoke ivory are terms that are usually found in the latest fashion notes from Paris. It is assumed that, customarily, railroads do not trouble themselves with matters such as these, but not so the Northwestern Pacific. Heretofore, the interiors of the steel coaches have been uniformly finished in dark mahogany, but Smoker 401 now displays an interior in gray with smoke ivory trimmings. Coach 452 is finished in tan, light green, and fawn; while Coach 460 has a green tone with lighter green trimmings. Even locomotives are in for colorful renaissance. Engine 52, which recently had a general overhauling in the shops, having been completely finished in Duco. The cab and upper part of the tank flange are finished in apple green and the sash in mahogany. The cylinders and side rods have a coat of aluminum while the boiler jacket is in beige. The tender is biscay green with letters and numerals in gold with a half-inch red border.

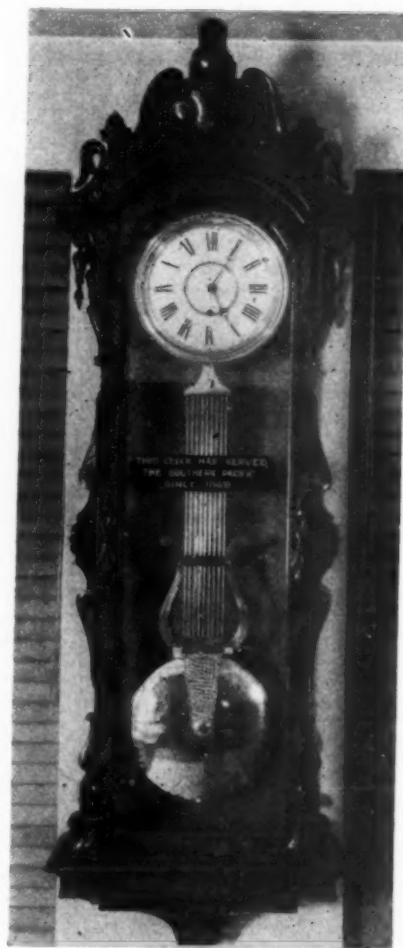
### A Confirmed Railway Builder

Frank Kell of Wichita Falls, Tex., not content with having been the father of six short line railroads in Texas and Oklahoma has, at an age when most men are retiring from railroad service, announced his intention of starting the construction of a seventh railroad. Four of Kell's railroads have been absorbed by larger systems during the last 34 years. He built his first line, from Wichita Falls to Henrietta, 18 miles, the Wichita Falls Railway, in 1895, and it was later absorbed by the Missouri-Kansas-Texas. The Katy also acquired his second venture, the Wichita Falls & Northwestern, extending from Wichita Falls to Hammon, Okla., with a branch to Wellington, Tex., 211 miles, while his Clinton & Oklahoma Western, between Clinton, Okla., and Cheyenne, 58 miles, was taken over by the Santa Fe in 1928 and the San Antonio, Uvalde & Gulf, in which he was a large stockholder, was acquired by the Missouri Pacific in 1925. Kell's two other proteges, the Wich-

ita Falls & Southern, extending from Wichita Falls to Breckenridge, Tex., 103 miles, and the Wichita Falls, Ranger & Fort Worth, between Breckenridge and Dublin, 66 miles, are now managed by Mr. Kell as president, although he once sold the former to the Katy and several years ago purchased it from that railroad.

### The Southern Pacific Clock

Referring to the articles in the *Railway Age* pertaining to old railway furniture, you may be interested in a Southern Pacific pioneer clock which came by boat around Cape Horn before the Overland Route was constructed by the Central Pacific and the Union Pacific. This clock has been in railroad service with this company since 1869. It now hangs in the general freight office in the Pacific building at Portland, Ore. Its long and faithful service has been recognized by a placard



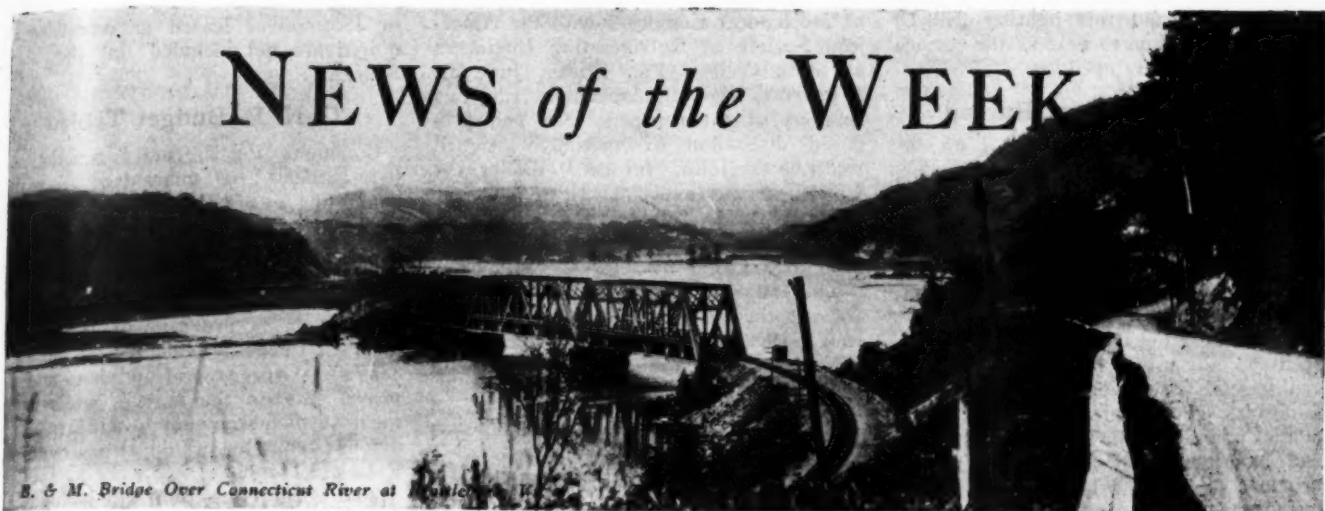
This Clock Sailed Around "The Horn"

placed on it reading, "This clock has served the Southern Pacific since 1869." This antique time piece is about six feet high and is known as a Swiss regulator. It was made in Switzerland but has no plate showing the date or maker. The workmanship throughout the making of this clock was excellent. Its pinwheel escapement is seldom seen in modern clocks, but it keeps excellent time. It was recently overhauled by the supervisor of time service for this company, who states that the clock is now as good as new and should, with proper care, give service indefinitely.

R. E. KELLY,  
Manager, Development Dept.,  
Southern Pacific.



# NEWS of the WEEK



B. & M. Bridge Over Connecticut River at Montpelier, Vt.

THE NEW ENGLAND RAILROAD CLUB will hold its annual banquet and entertainment at Copley-Plaza Hotel, Boston, on May 14.

THE CANADIAN RAILWAY CLUB will hold its next meeting on Monday evening, May 13. This will be the annual election of officers.

THE CAR FOREMEN'S ASSOCIATION OF ST. LOUIS will hold its next meeting on Tuesday evening, May 7, at the American Annex, St. Louis. There will be a general discussion on the changes in the interchange rules.

THE WESTERN RAILWAY CLUB will hold its annual dinner at Hotel Sherman, Chicago, on May 6. The principal speakers will be Walter W. Head, president of the State Bank of Chicago, and Frank W. Noxon, secretary of the Railway Business Association.

THE CINCINNATI RAILWAY CLUB will hold its next meeting at the Chamber of Commerce, Cincinnati, on May 14. The principal speaker will be Judge Baggett of Dayton, Ohio. There will be an exhibition of motion pictures by the Whiting Corporation and the Cincinnati Street Railway Company.

THE CAR FOREMEN'S ASSOCIATION OF CHICAGO will hold its next meeting on Monday, May 13, at the Great Northern Hotel. L. M. Carlton will read a paper on the car foreman's relation to the maintenance of air brakes.

## Grade Crossings Eliminated

A total of 390 railroad grade crossings were eliminated from the federal aid highway system in 1928, according to a statement by the Bureau of Public Roads of the United States Department of Agriculture. Of the 390 crossings, 107 were grade separations and 283 were done away with by relocation of highways. In the period from 1917 to December 31, 1928, a total of 4,291 crossings have been eliminated on the federal aid system with federal aid—947 through grade separations, and 3,344 through relocation of highways.

For the year 1928, Wisconsin heads the list of eliminations, with a total of 35. Alabama is second with 31; Mich-

igan, 26; Texas, 25; Indiana, 24; Kansas, 23; Montana, 22. Georgia and Illinois each are credited with 21, and Mississippi with 17.

## New York State Legislation

The Governor of New York has approved Chapter 686 amending section 50-a, P. S. C. law, to empower railroads to operate supplemental omnibus routes with local consent.

The Governor has also signed Chapter 687 amending sections 54 and 55 regulating the holding of stock of subsidiary corporations; also Chapter 688, amending section 141, regulating the issuance of stock.

Governor Roosevelt has vetoed the Shonk bill, proposing to limit the liability of owners of aviation fields.

## 1928 Rail Output—Correction

In the *Railway Age* of April 13, in an article entitled "Rail Output Less in 1928", the last line in the table headed "Production of Rails by Weight Per Yard, 1915-1928" which gave rail production data for 1928 was, through a typographical error, incorrectly given. This last line should have shown 1928 rail production divided among the various weights per yard as follows:

Under 50 lb., 134,197 tons; 50 and less than 85 lb., 125,726 tons; 85 and less than 100 lb., 465,393 tons; 100 and less than 120 lb., 1,203,749 tons; 120 lb. and over, 718,428 tons; total, 2,647,493 gross tons.

## Shopmen Employed Full Time

A report compiled by the United States Department of Labor shows a greater percentage of full-time employment for machinists during 1927 on the Great Northern than on any other Class I road. During that time the percentage of full-time employment was 98.4. The full-time employment of shop men of other railroads during that time was: Atchison, Topeka & Santa Fe, 98.2 per cent; Louisville & Nashville, 97.2 per cent; Chicago, Burlington & Quincy, 96.8 per cent; Chicago, Milwaukee, St. Paul & Pacific, 95.6 per cent; Southern Pacific, 95.5; Baltimore & Ohio, 94.2.

## Advertising on Cars

The Board of Directors of the American Railway Association at their meet-

ing on April 12, adopted a resolution reaffirming the association's objection to advertising on cars. Declaring that the railroads of the country now furnish an adequate supply of freight cars of all classes and that the owners or lessors of certain private car lines are seeking to serve individuals, firms and industries with cars no better or more suitable than those which are furnished by the railroads—such service being generally contingent upon the privilege of painting trade marks, pictures, etc., on sides of the cars—all concerned are notified that such advertising makes the use of the cars objectionable. The Board resolved that unless there is a discontinuance of the objectionable practice it will be found necessary for the railroads to decline to accept cars containing shippers' carowners' advertising.

## Westinghouse Lamp Company to Open Lighting Institute

A lighting institute which consists of a large permanent exhibit is to be opened in the Grand Central Palace, New York City, by the Westinghouse Lamp Company during the latter part of May. Various rooms in the exhibit will be given over to different types of lighting. There will be a transportation room, an industrial lighting room, an electrical store, a general office, a director's office, a conference room, a corridor, a reception room and a public hall. In the transportation room will be a demonstration of various methods of lighting steam and electric railway cars and buses. It will also contain a model airport, showing all types of airport equipment including a hangar and administration buildings built to scale and properly lighted throughout with model airplanes in actual operation. There will also be a specially built model of a railroad system, showing stations, tunnels, switches, sidings, train lighting, etc.

The industrial lighting room will include a demonstration of various methods of general lighting, local lighting and special applications to specific needs, such as bench assembly work, heavy press work, lathe work and fine work requiring local lighting.

Each of the other rooms will contain examples of lighting as the name of the

room implies and this lighting will be changed from time to time as the science of lighting is developed.

### Freight Container Bureau

The Freight container bureau (A. R. A.) 30 Vesey street, New York City, has issued its report No. 7 containing the annual report of Edward Dahill, chief engineer of the bureau, dated March 1.

The activities of this bureau are constantly increasing, and Mr. Dahill has seven assistants constantly at work. They travel all over the United States and have been specially useful in the southern fruit and vegetable shipping districts. Representatives of the bureau have given 34 public addresses during the past year and have published numerous magazine articles. Besides originating important improvements in the packing and shipping of fruits and vegetables, the engineers of the bureau have done extensive work in improving shipping conditions of new furniture, machinery and other commodities. Conferences with executives and traffic officers during the year 1928 have been numbered by the hundreds, and they have made over 1200 inspections of shipping containers.

The report contains five appendices, detailing these activities, and a sixth setting forth the program of what the bureau intends to do in the coming year. The educational bulletins of the bureau published during the past six years number, 17; and besides these, a large number of circulars have been distributed.

### Couzens Chairman of Senate I. C. Committee

The Senate on April 22 approved the assignment of Senator James Couzens, of Michigan, as chairman of the committee on interstate commerce, succeeding Senator James E. Watson, of Indiana, who has been chosen majority leader of the Senate. Senators Brookhart, of Iowa, and Kean, of New Jersey, also were made members of the committee.

The introduction of bills in the Senate began on April 18, when a number of the old stand-bys were reintroduced. These include one to provide for reduced fares for military and naval officers and men while on leave of absence or furlough, a steel car bill, the bill for the establishment of an eight-hour day for yardmasters, Senator Robinson's surcharge bill and steel car bill, and Senator Capper's resolution directing the Interstate Commerce Commission to adjust rates on export grain and grain products to meet Canadian rates. Senator Hayden, of Arizona, has introduced a fourth-section bill.

A bill to amend the fourth section of the interstate commerce act, to prohibit departures from the long-and-short-haul rule on account of water competition, has been introduced in the House by Representative Taylor.

### Spring Meeting of Refrigerating Engineers at State College

Arrangements have been completed for the holding of a joint session of the Railroad Division of the American Society

of Mechanical Engineers with the American Society of Refrigerating Engineers at State College, Pa., Friday, June 21. A program has been planned covering two sessions of three papers each and prepared discussion of specially assigned topics. A joint, informal dinner, at which executives prominent in both the railroad and refrigerating industries have been invited to speak, has also been arranged.

The following is the program arranged for the three-day meeting of the American Society of Refrigerating Engineers, which includes the joint session with the Railroad Division:

Thursday, June 20

Morning

Ice plant design  
Factors in keeping ice plant records  
Oil engines for ice plant compressors  
Structures for ice plants

Afternoon

Climatic studies; effect on refrigeration  
Instruments for engineering measurements; electrical method  
Demonstration of heat transmission investigations  
Demonstration of testing machinery  
Outing in mountains at Colerain Forge; visit to Ice Caves

Friday, June 21

Morning

Symposium on Refrigerated Transport. Joint session with the Railroad Division, A.S.M.E.  
Current practices in transit refrigeration  
Economic factors in handling perishables by rail, by J. W. Roberts, assistant vice president, Pennsylvania, New York  
Practice in food handling

Afternoon

Symposium continued  
Practice in refrigerator car design, by E. A. Tweedy, mechanical superintendent, Fruit Grower's Express, Alexandria, Va.  
Machinery for precooling stations  
Research studies on refrigerated trains  
Informal banquet

Saturday, June 22

Technical session; Household refrigeration  
Survey of household refrigeration industry  
Merchandising practice in refrigerators  
Research work in refrigerators

All meetings will be held in the assembly room of Varsity Hall, State College. The exhibits will be in the Mechanical Engineering laboratory and thermal plant.

### Cars and Locomotives On Order

Freight cars on order on April 1, by the railroads totaled 42,561, as compared with 25,248 on the same date last year, according to reports received from the carriers by the Car Service Division of the American Railway Association. On March 1, this year, 37,820 freight cars were on order.

Of the total 18,108 were box cars, an increase of 9,569 compared with the same date last year. Coal cars for which orders have been placed number 18,997, an increase of 9,912 compared with April 1 last year. Reductions, for the most part small, were reported in the number of refrigerator, stock and flat cars on order this year compared with one year ago.

Locomotives on order on April 1, this year, numbered 372 compared with 137 on the same day in 1928.

New or rebuilt freight cars placed in service in the first three months of 1929 totaled 8,544, of which box cars totaled 3,992; coal cars, 2,232; flat cars 762; refrigerator cars, 1,343, and stock cars 155. Sixty cars of other classes were also installed in service. New or rebuilt locomotives placed in service in the first three months of 1929 totaled 118. Freight cars

or locomotives leased or otherwise acquired are not included in the above figures.

### C. N. R. Budget Tabled

Commons Parliamentary sanction for the issuance of guaranteed securities amounting to \$53,750,000 is sought in the 1929 estimates of the Canadian National, tabled in the House of Commons at Ottawa by Hon. James A. Robb, Minister of Finance. The estimates which cover the company's program of construction and betterment, provide for an outlay of \$35,750,000 for general additions and improvements on the system, while equipment payments amount to \$6,313,400. The amount requested would also provide for a sinking fund.

The general program will include laying of heavy rails, some double track and grade revision to facilitate grain movements, extension of passing tracks, extension of freight and passenger yard and terminal facilities, new bridges, new hotel structures, new ships for the Pacific coastal service of the company, and numerous other items.

Continuing the policy of increasing the standard and laying 100-pound rail on the main line between Halifax and Vancouver, this work, which has been under way during the past years, will proceed on the Atlantic, Central and Western regions. In all, 916 track miles of new heavy rail is to be provided, requiring the purchase of 169,000 tons at a cost of \$9,500,000, including rail fastenings, of which amount \$1,112,000 is chargeable to capital account.

Much new ballast will be placed during the year, rock ballast being extended over additional areas between Montreal and Sarnia to an amount of 400,000 yards, and crushed and washed stone will be used between Sarnia and Chicago, to the extent of 300,000 yards, while gravel ballast to a total of 900,000 yards will be placed at various parts of the system.

To facilitate grain movement between Winnipeg and the head of the lakes, two stretches of double track and a grade revision have been planned. One such stretch will be from South Junction to Middleboro, the other from Baynham to Woodridge in Manitoba. Another section of double track planned for this year is from Chappell Junction to South Saskatoon.

### Texas & Pacific Emergency Board Closes Dallas Hearing

At the conclusion of hearings before the emergency board investigating the dispute between the management and the trainmen of the Texas & Pacific on April 18, it was announced that one of the subsidiary issues involved in the general controversy over the removal of two terminals in Texas and Louisiana—the question of adequate motor-coach service for employees at Fort Worth, Tex., and Mineola and Shreveport, La.—had been satisfactorily settled. Two other issues—the removal of the terminals from Longview and Marshall to Mineola and Shreveport and the contemplated assign-



ment of freight crews—were withdrawn from the jurisdiction of the board and later became the subject of conferences between brotherhood and railway officers on April 22.

The railroad acceded to the request of the trainmen regarding the assignment of crews in freight service, the agreement providing that 20 crews be assigned to the Lancaster Yards-Minneapolis run, 15 crews to the Mineola-Texas run and 9 crews to the Mineola-Shreveport run. The other point agreed on concerned the trainmen's claim that all terminal rules, agreements and conditions be applied at Mineola as provided for by agreements. The question of switching service in the Mineola yards has been left in abeyance, pending

a check of operations. The trainmen have demanded that yard crews be assigned to the switching work, while the railroad wants the road crews to continue doing this work.

The board, at the close of the hearing, had before it the questions of compensation for losses sustained by the men on homes they abandoned, the pooling of cabooses in freight service, the assignment of passenger locomotive crews to operate through Longview and the demand of the men for application of Texas & Pacific wage schedules to and interchange of seniority rights with five subsidiary lines. The board immediately began the preparation of its report which must be presented to President Hoover before April 28.

Trainmen testified that they object to the pooling of cabooses because of the insanitary condition in which they are sometimes left by previous occupants. H. D. Earl, general manager of the Texas & Pacific, asserted that by following the practice of pooling cabooses the railroad had been able to make a saving of about \$100,000 a year.

### Through Ticket Condition Sustained

A citizen of Louisiana bought a ticket from New Orleans to Washington in the office of the Louisville & Nashville in New Orleans, over the L. & N., Atlanta & West Point and the Southern. He took

(Continued on page 984)

## Operating Revenues and Operating Expenses of Class I Steam Railways in the United States

Compiled from the Monthly Reports of Revenues and Expenses for 182 Steam Railways, Including 16 Switching and Terminal Companies.

Item	United States		Eastern District		Pocahontas Region		Southern Region		Western District	
	1929	1928	1929	1928	1929	1928	1929	1928	1929	1928
	Average number of miles operated									
Revenues:										
Freight	\$362,957,321	\$346,257,486	\$159,512,245	\$148,745,161	\$20,155,862	\$17,522,302	\$48,446,615	\$48,220,715	\$134,842,599	\$131,769,308
Passenger	68,246,730	69,547,263	34,229,472	34,721,655	1,283,052	1,368,356	10,561,206	10,891,952	22,173,000	22,565,300
Mail	8,774,528	7,646,865	3,281,593	2,876,592	235,109	198,199	1,301,084	1,135,416	3,956,742	3,436,658
Express	9,520,003	9,080,769	4,537,096	4,179,939	205,130	222,897	1,430,547	1,223,100	3,347,230	3,454,833
All other transportation	15,893,847	15,255,149	8,908,244	8,506,842	164,320	196,006	958,193	933,192	5,863,090	5,619,109
Incidental	9,041,554	8,377,367	4,732,626	4,219,539	251,756	303,047	1,154,215	1,201,947	2,902,957	2,652,834
Joint facility—Cr.	991,949	1,027,010	330,942	408,144	10,155	13,224	134,027	129,450	516,825	476,192
Joint facility—Dr.	313,754	347,682	77,677	121,269	3,647	1,669	31,796	30,922	200,634	193,822
Ry. operat'g revenues	475,112,178	456,844,227	215,454,541	203,536,603	22,301,737	19,822,362	63,954,091	63,704,850	173,401,809	169,780,412
Expenses:										
Maintenance of way and structures	55,401,249	56,436,809	23,328,419	23,755,682	3,020,345	2,931,856	8,585,383	8,800,858	20,467,102	20,948,413
Mainten'ce of equipm't	94,163,172	94,580,212	45,012,068	44,063,489	4,398,753	4,556,458	11,957,467	12,704,990	32,794,884	33,255,275
Traffic	10,256,399	9,952,249	3,820,022	3,699,615	266,824	253,393	1,695,578	1,783,590	4,473,975	4,215,651
Transportation	170,605,905	168,595,063	79,716,434	79,500,629	5,552,521	5,542,277	21,893,077	22,666,987	63,443,873	60,885,170
Miscellaneous operat'ns	4,470,062	4,345,663	2,060,898	2,052,746	73,151	81,540	602,015	640,704	1,733,998	1,570,673
General	15,499,421	15,825,516	6,679,096	7,056,732	577,275	610,809	2,042,806	2,021,785	6,200,244	6,136,190
Transportation for investment—Cr.	712,431	1,037,451	186,970	116,051	7,549	25,409	49,870	91,788	468,042	804,203
Ry. operat'g expenses	349,683,777	348,698,061	160,429,967	160,012,842	13,881,320	13,950,924	46,726,456	48,527,126	128,646,034	126,207,169
Net revenue from railway operations	125,428,401	108,146,166	55,024,574	43,523,761	8,420,417	5,871,438	17,227,635	15,177,724	44,755,775	43,573,243
Railway tax accruals	31,423,165	29,126,852	12,424,272	11,386,886	1,735,956	1,683,532	4,398,409	4,010,250	12,864,528	12,046,184
Uncollectible ry. rev's	82,594	119,395	26,968	65,516	1,744	1,129	20,705	15,674	33,177	37,076
Ry. operating income	93,922,642	78,899,919	42,573,334	32,071,359	6,682,717	4,186,777	12,808,521	11,151,800	31,858,070	31,489,983
Equip't rents—Dr. bal.	7,242,086	7,279,099	4,012,970	4,049,399	662,319	452,640	664,412	720,693	3,187,923	3,035,408
Joint facility rent—Dr. balance	1,911,394	1,797,635	855,568	862,121	103,973	100,282	102,964	76,585	848,889	758,647
Net railway operating income	84,769,162	69,823,185	37,704,796	27,159,839	7,201,963	4,612,896	12,041,145	10,354,522	27,821,258	27,695,928
Ratio of expenses to revenues (per cent)...	73.60	76.33	74.46	78.62	62.24	70.38	73.06	76.17	74.19	74.34
FOR TWO MONTHS ENDED WITH FEBRUARY, 1929 AND 1928										
Average number of miles operated	240,804.07	239,975.71	59,438.99	59,375.78	5,633.30	5,620.98	40,146.82	40,025.04	135,584.96	134,953.91
Revenues:										
Freight	\$729,341,024	\$683,831,261	\$320,171,274	\$293,525,354	\$40,403,243	\$35,421,527	\$97,549,710	\$95,698,442	\$271,216,797	\$259,185,938
Passenger	143,084,678	148,026,569	72,980,354	74,823,675	2,689,510	2,957,987	20,837,473	22,264,068	46,577,341	47,980,839
Mail	18,055,307	15,465,197	6,834,707	5,797,814	480,516	410,146	2,648,363	2,318,738	8,091,721	6,938,499
Express	18,607,708	17,208,608	8,708,559	7,737,060	392,681	427,127	2,764,271	2,339,439	6,742,197	6,704,982
All other transportation	32,097,936	30,659,253	18,038,311	17,057,593	331,759	361,005	1,909,249	1,859,399	11,818,617	11,381,256
Incidental	18,895,935	17,884,736	9,925,397	9,187,968	513,145	640,206	2,289,550	2,370,884	6,167,843	5,685,678
Joint facility—Cr.	2,052,810	2,123,140	697,140	866,506	17,617	23,707	278,342	253,881	1,059,711	979,046
Joint facility—Dr.	621,182	723,072	154,853	259,054	8,331	4,487	59,522	60,532	398,476	398,999
Ry. operat'g revenues	961,514,216	914,475,692	437,200,889	408,736,916	44,820,140	40,237,218	128,217,436	127,044,319	351,275,751	338,457,239
Expenses:										
Maintenance of way and structures	113,688,630	114,867,535	48,281,315	48,790,670	5,912,840	5,827,759	17,470,965	17,722,028	42,023,510	42,527,078
Mainten'ce of equipm't	194,246,675	192,213,469	92,815,039	89,382,932	9,107,541	9,068,456	24,471,174	25,652,047	67,852,921	68,110,034
Traffic	20,892,828	20,427,919	7,763,801	7,522,290	553,313	537,711	3,579,353	3,752,337	8,996,361	8,615,581
Transportation	350,249,314	345,629,137	163,968,120	162,111,061	11,358,718	11,386,622	44,764,619	46,327,309	130,157,857	125,804,145
Miscellaneous operat'ns	9,277,797	9,014,661	4,357,413	4,299,491	144,671	163,458	1,182,594	1,234,658	3,593,119	3,317,054
General	31,716,180	32,135,957	13,719,356	14,369,029	1,181,197	1,233,697	4,185,465	4,129,533	12,630,162	12,403,698
Transportation for investment—Cr.	1,459,892	2,000,203	302,504	284,735	12,883	38,327	118,970	189,739	1,025,535	1,487,402
Ry. operat'g expenses	718,611,532	712,288,475	330,602,540	326,190,738	28,245,397	28,179,376	95,535,200	98,628,173	264,228,395	259,290,188
Net revenue from railway operations	242,902,684	202,187,217	106,598,349	82,546,178	16,574,743	12,057,842	32,682,236	28,416,146	87,047,356	79,167,051
Railway tax accruals	62,709,417	57,796,670	24,648,266	22,580,498	3,487,409	3,360,882	8,800,558	8,156,540	25,773,184	23,698,750
Uncollectible ry. rev's	155,460	212,269	60,735	114,124	2,048	2,271	32,956	29,171	59,721	66,703
Ry. operating income	180,037,807	144,178,278	81,889,348	59,851,556	13,085,286	8,694,689	23,848,722	20,230,435	61,214,451	55,401,598
Equip't rents—Dr. bal.	14,281,541	14,189,769	8,175,908	7,890,608	41,181,848	49,741,117	1,024,657	1,303,680	6,262,832	5,969,598
Joint facility rent—Dr. balance	3,868,350	3,720,399	1,835,144	1,826,183	218,263	242,782	128,347	23,179	1,686,596	1,628,255
Net railway operating income	161,887,916	126,268,110	71,878,304	50,134,765	14,048,871	9,426,024	22,695,718	18,903,576	53,265,023	47,803,745
Ratio of expenses to revenues (per cent)...	74.74	77.89	75.62	79.80	63.02	70.03	74.51	77.63	75.22	76.61

<sup>a</sup> Includes \$3,201,913 sleeping and parlor car surcharge. <sup>b</sup> Includes \$3,034,433 sleeping and parlor car surcharge. <sup>c</sup> Includes \$6,514,558 sleeping and parlor car surcharge. <sup>d</sup> Deficit or other reverse items. <sup>e</sup> Includes \$6,329,638 sleeping and parlor car surcharge.

Compiled by the Bureau of Statistics, Interstate Commerce Commission. Subject to revision.

## Operating Statistics of Large Steam Railways—Selected Items for February, 1929, Comp

Region, road and year	Average miles of road operated	Train-miles	Locomotive-miles		Car-miles		Ton-miles (thousands)		Average number of locomotives on line					
			Principal and helper	Light	Loaded (thousands)	Per cent loaded	Gross, Excluding locomotives and tenders	Net, Revenue and non-revenue	Servicable	Unservicable	Per cent unservicable	Stored		
New England Region:														
Boston & Albany.....	1929	407	189,963	200,779	18,949	4,686	67.3	241,190	89,856	106	22	16.8	27	
	1928	407	195,025	209,133	22,529	4,727	64.8	244,650	86,809	104	19	15.7	10	
Boston & Maine.....	1929	2,070	369,430	435,768	56,413	11,944	70.2	612,369	236,262	297	30	9.1	72	
	1928	2,074	412,439	529,242	38,058	11,673	69.0	602,573	229,130	257	64	20.0	20	
N. Y., New H. & Hart.....	1929	2,102	475,116	532,641	29,464	14,275	68.0	755,665	302,803	287	74	20.5	24	
	1928	2,130	512,145	562,915	35,146	14,266	66.9	748,987	293,066	328	54	14.0	50	
Great Lakes Region:														
Delaware & Hudson.....	1929	875	312,779	417,250	41,405	9,608	64.3	582,826	279,205	235	36	13.3	72	
	1928	875	308,487	414,186	48,244	9,031	63.7	553,161	260,017	245	35	12.6	90	
Del., Lack. & Western.....	1929	998	516,084	586,643	71,098	17,485	69.5	960,124	416,374	240	49	17.0	6	
	1928	998	516,729	583,163	64,679	15,892	65.3	904,656	370,982	248	53	17.6	11	
Erie (inc. Chi. & Erie).....	1929	2,317	872,345	953,483	81,544	37,167	64.0	2,247,631	961,811	404	103	20.3	15	
	1928	2,317	872,001	957,379	72,288	34,455	63.7	2,036,647	841,080	431	111	20.5	31	
Lehigh Valley.....	1929	1,343	517,127	569,656	60,569	15,946	66.0	923,383	396,509	308	103	25.0	43	
	1928	1,345	503,621	550,392	62,095	15,372	65.1	877,284	360,369	369	74	16.7	90	
Michigan Central.....	1929	1,822	586,078	598,937	20,429	20,941	62.0	1,161,884	406,524	200	45	18.4	15	
	1928	1,822	570,649	587,379	17,423	19,200	59.8	1,077,109	360,246	204	88	30.2	25	
New York Central.....	1929	6,467	2,027,107	2,290,322	169,880	75,428	60.6	4,680,626	1,975,367	921	398	30.2	84	
	1928	6,459	1,994,237	2,228,784	158,315	72,906	59.6	4,483,701	1,845,904	1,078	334	23.7	290	
New York, Chi. & St. L.....	1929	1,665	650,751	657,961	7,345	21,075	64.0	1,206,730	479,824	212	68	24.3	31	
	1928	1,665	623,392	631,991	7,008	20,274	62.3	1,149,016	430,208	229	53	18.6	59	
Pere Marquette.....	1929	2,178	424,088	427,645	4,347	11,016	63.4	659,633	288,231	180	32	15.2	18	
	1928	2,181	386,934	390,329	3,978	10,027	61.0	599,089	247,887	178	42	19.2	27	
Pitts. & Lake Erie.....	1929	231	128,720	129,844	2,416	4,616	59.6	371,329	207,531	54	10	16.1	10	
	1928	231	119,686	121,184	1,921	4,022	56.5	344,912	187,701	53	19	26.5	9	
Wabash.....	1929	2,497	881,980	922,349	12,549	25,402	63.9	1,456,566	550,260	285	75	20.9	7	
	1928	2,497	759,927	801,576	13,865	22,967	63.8	1,283,966	466,724	313	50	13.7	65	
Central Eastern Region:														
Baltimore & Ohio.....	1929	5,536	1,861,217	2,231,767	155,245	53,076	61.1	3,562,687	1,659,064	964	249	20.5	78	
	1928	5,534	1,817,617	2,141,006	161,556	51,200	60.3	3,413,137	1,572,099	958	281	22.7	125	
Central of New Jersey.....	1929	691	250,188	270,610	42,253	7,143	57.2	489,955	229,498	174	35	16.7	18	
	1928	691	235,789	256,792	44,842	6,552	58.4	438,367	204,678	185	32	14.7	46	
Chicago & Eastern Ill.....	1929	946	266,144	268,065	3,613	6,751	63.2	431,749	199,168	87	72	45.4	8	
	1928	945	261,682	263,233	3,440	6,588	62.6	421,819	195,853	109	45	29.1	27	
Clev., Cin., Chi. & St. L.....	1929	2,371	793,182	822,720	21,610	23,865	59.2	1,602,740	735,896	309	120	27.9	3	
	1928	2,373	738,623	765,383	17,944	22,109	61.5	1,447,882	675,543	329	105	24.2	38	
Elgin, Joliet & Eastern.....	1929	453	152,440	164,289	8,904	4,176	62.0	320,856	166,675	82	6	6.3	...	
	1928	461	137,487	147,224	7,488	3,817	61.4	291,940	148,595	80	9	10.0	...	
Long Island.....	1929	396	38,474	42,207	15,924	545	53.7	36,884	13,854	50	10	16.0	...	
	1928	396	44,853	51,248	11,522	545	55.2	35,693	13,377	46	12	20.6	...	
Pennsylvania System.....	1929	10,738	3,720,284	4,314,304	413,211	126,848	62.9	8,490,102	3,938,879	2,728	314	10.3	659	
	1928	10,844	3,756,738	4,228,437	359,447	120,075	62.9	7,844,483	3,570,218	2,808	409	12.7	836	
Reading.....	1929	1,453	667,863	695,070	48,130	16,697	59.8	1,169,819	579,657	331	78	19.0	21	
	1928	1,417	617,885	668,218	62,230	15,800	57.7	1,131,779	552,652	334	77	18.7	40	
Pocahontas Region:														
Chesapeake & Ohio.....	1929	2,731	1,098,048	1,187,168	48,919	37,006	55.5	3,012,884	1,619,601	530	100	15.9	32	
	1928	2,717	1,081,333	1,173,798	47,197	34,755	56.3	2,809,617	1,505,814	550	94	14.5	69	
Norfolk & Western.....	1929	2,230	869,146	1,009,672	45,636	31,194	57.0	2,701,779	1,440,953	482	58	10.7	85	
	1928	2,231	768,721	922,425	36,917	26,971	59.1	2,235,410	1,173,732	530	51	8.8	144	
Southern Region:														
Atlantic Coast Line.....	1929	5,148	694,465	699,507	9,177	18,296	57.9	1,024,526	350,266	440	54	10.9	80	
	1928	5,105	688,637	690,719	10,326	17,121	55.1	986,556	369,288	411	57	12.2	85	
Central of Georgia.....	1929	1,898	240,213	241,819	3,496	6,205	72.3	319,877	129,876	130	22	14.2	10	
	1928	1,898	253,589	254,458	6,259	6,235	70.4	336,002	141,182	139	20	12.7	13	
Ill. Cent. (inc. Y. & M. V.).....	1929	6,710	2,006,231	2,019,863	31,461	51,949	61.4	3,472,736	1,503,794	747	102	12.0	16	
	1928	6,595	1,880,986	1,893,843	43,973	50,231	61.6	3,311,185	1,413,850	767	114	12.9	29	
Louisville & Nashville.....	1929	5,066	1,578,548	1,664,490	61,311	33,354	58.5	2,331,386	1,117,879	585	107	15.4	19	
	1928	5,061	1,641,267	1,713,882	58,035	33,400	58.5	2,316,878	1,103,640	612	97	13.7	25	
Seaboard Air Line.....	1929	4,475	572,736	594,710	6,798	15,005	61.4	868,318	304,775	255	57	18.3	9	
	1928	4,484	533,121	542,128	13,684	13,294	63.8	757,000	292,996	252	64	20.2	...	
Southern.....	1929	6,679	1,413,681	1,445,624	33,049	34,608	63.9	1,953,589	785,064	832	131	13.6	102	
	1928	6,720	1,365,243	1,394,022	30,395	34,404	63.9	1,942,034	782,531	846	110	11.5	89	
Northwestern Region:														
Chi. & North Western.....	1929	8,467	1,475,292	1,573,948	31,294	33,376	60.8	2,055,902	784,340	766	91	10.6	103	
	1928	8,463	1,437,377	1,509,993	24,684	34,325	61.9	2,039,122	809,319	810	130	13.8	135	
Chi., Milw., St. P. & Pac.....	1929	11,248	1,665,712	1,799,405	107,572	44,513	63.7	2,667,319	1,131,779	802	131	14.0	126	
	1928	11,249	1,592,076	1,703,001	105,154	45,676	63.5	2,691,667	1,134,784	829	143	14.7	193	
Chi., St. P., Minn. & Om.....	1929	1,724	328,312	359,551	17,684	6,215	63.3	368,341	152,447	152	19	11.1	17	
	1928	1,724	316,601	338,180	16,158	6,466	66.2	364,612	155,948	157	27	14.6	21	
Great Northern.....	1929	8,377	821,030	850,379	68,058	25,650	69.3	1,494,677	692,245	494	142	22.4	78	
	1928	8,156	745,510	770,516	44,067	25,726	68.7	1,489,797	674,180	549	123	18.3	138	
Minn., St. P. & S. St. M.....	1929	4,357	477,597	494,565	7,139	11,832	69.5	636,211	285,201	208	44	17.6	31	
	1928	4,358	497,891	510,874	6,624	12,148	67.5	655,712	287,670	224	41	15.6	14	
Northern Pacific.....	1929	6,476	772,694	828,857	52,686	23,373	71.8	1,300,487	581,730	441	119	21.2	52	
	1928	6,414	731,930	773,306	43,982	24,361	72.3	1,333,457	606,187	456	151	24.9	64	
Oreg.-Wash. R. R. & Nav.....	1929	2,246	207,142	226,060	18,994	5,724	70.2	342,482	158,611	126	23	15.5	12	
	1928	2,246	182,571	193,820	14,125	5,421	70.4	312,331	142,441	134	12	7.9	20	
Central Western Region:														
Atch., Top. & S. Fe. (incl. P. & S. F.).....	1929	10,416</												



Compared with February, 1928, for Roads with Annual Operating Revenues Above \$25,000,000

Region, road and year	Average number of freight cars on line			Per cent un-serv-ice-able	Gross ton-miles per train, ex-cluding locomotives and tenders	Gross tons per train, ex-cluding locomotives and tenders	Net tons per train	Net tons per loaded car	Net ton-miles per car-day	Car miles per car-day	Net ton-miles per mile of road per day	Pounds of coal per 1,000 gross ton-miles, including locomotives and tenders	Locomotive miles per loco-motive-day
	Home	Foreign	Total										
New England Region:													
Boston & Albany.....1929	3,155	5,066	8,221	3.6	18,140	1,270	473	19.2	390	30.2	7,883	187	61.5
.....1928	3,656	4,702	8,358	6.3	17,970	1,254	443	18.4	358	30.1	7,354	191	64.5
Boston & Maine.....1929	10,253	10,901	21,154	2.9	20,764	1,658	640	19.8	399	28.7	4,077	125	53.9
.....1928	12,354	10,116	22,470	5.4	16,483	1,461	556	19.6	352	26.0	3,810	132	60.9
N. Y., New H. & Hart.....1929	14,955	16,176	31,131	9.9	21,218	1,590	637	21.2	347	24.1	5,145	125	55.6
.....1928	17,288	15,971	33,259	11.2	19,418	1,462	572	20.5	304	22.1	4,744	129	54.1
Great Lakes Region:													
Delaware & Hudson.....1929	9,078	6,077	15,155	3.6	22,596	1,863	893	29.1	658	35.2	11,396	153	60.5
.....1928	10,580	5,455	16,035	4.0	21,384	1,793	843	28.8	559	30.5	10,247	158	56.8
Del., Lack. & Western.....1929	15,887	8,500	24,387	4.0	23,493	1,860	807	23.8	610	36.9	14,898	156	81.1
.....1928	18,195	6,666	24,861	4.5	21,804	1,751	718	23.3	515	33.7	12,818	159	74.1
Erie (inc. Chi. & Erie).....1929	30,270	20,916	51,186	4.5	31,928	2,577	1,103	25.9	671	40.5	14,827	129	72.9
.....1928	32,030	17,969	49,999	5.5	28,789	2,336	965	24.4	580	37.3	12,518	136	65.5
Lehigh Valley.....1929	20,550	8,812	29,362	9.5	24,841	1,786	767	24.9	482	29.4	10,541	165	54.9
.....1928	23,888	8,144	32,032	7.1	24,466	1,742	716	23.4	388	25.4	9,236	168	47.7
Michigan Central.....1929	18,837	20,065	38,902	5.1	31,134	1,982	694	19.4	373	31.0	7,969	121	90.2
.....1928	20,811	14,073	34,884	5.0	29,700	1,888	631	18.8	356	31.7	6,818	121	71.5
New York Central.....1929	68,233	70,439	138,672	5.1	29,685	2,309	974	26.2	509	32.0	10,909	122	66.6
.....1928	74,777	66,171	140,948	4.6	29,484	2,248	926	25.3	452	29.9	9,855	122	58.3
New York, Chi. & St. L.....1929	12,871	11,417	24,288	6.9	25,750	1,854	737	22.8	706	48.4	10,294	120	84.8
.....1928	14,926	10,020	24,946	5.9	25,374	1,843	690	21.2	595	45.0	8,911	119	78.2
Pere Marquette.....1929	9,801	9,745	19,546	3.6	20,177	1,555	680	26.2	527	31.7	4,727	117	72.9
.....1928	10,979	7,327	18,306	4.3	20,316	1,548	641	24.7	467	31.0	3,920	116	61.8
Pitts. & Lake Erie.....1929	12,995	8,079	21,074	11.6	32,264	2,885	1,612	45.0	352	13.1	32,048	111	73.9
.....1928	16,629	6,571	23,200	4.1	31,772	2,882	1,568	46.7	279	10.6	27,987	111	59.3
Wabash.....1929	13,884	15,526	29,410	2.5	25,080	1,651	624	21.7	668	48.3	7,872	144	92.8
.....1928	16,390	11,086	27,476	2.7	27,047	1,690	614	20.3	586	45.1	6,445	140	77.5
Central Eastern Region:													
Baltimore & Ohio.....1929	71,031	30,285	101,316	6.4	21,893	1,914	891	31.3	585	30.6	10,702	167	70.3
.....1928	76,899	28,630	105,529	4.9	21,563	1,878	865	30.7	514	27.8	9,795	166	64.1
Central of New Jersey.....1929	18,151	11,132	29,283	6.1	22,844	1,958	917	32.1	280	15.2	11,869	166	53.6
.....1928	19,780	10,397	30,177	6.2	20,503	1,859	868	31.2	234	12.8	10,214	158	48.0
Chicago & Eastern Ill.....1929	12,507	4,522	17,029	40.9	24,015	1,622	748	29.5	418	22.4	7,517	151	61.2
.....1928	13,660	3,582	17,242	31.3	23,117	1,612	748	29.7	392	21.0	7,146	147	59.8
Gev., Cin., Chi. & St. L.....1929	20,413	21,224	41,637	4.6	27,312	2,021	928	30.8	631	34.6	11,084	129	70.3
.....1928	23,890	20,121	44,011	3.3	26,363	1,960	915	30.6	529	28.2	9,817	131	62.2
Elgin, Joliet & Eastern.....1929	9,094	9,075	18,169	6.3	12,559	2,105	1,093	39.9	328	13.2	13,134	159	71.1
.....1928	9,362	7,469	16,831	4.8	15,721	2,123	1,081	38.9	304	12.7	11,125	151	59.9
Long Island.....1929	1,597	4,473	6,070	2.8	6,110	959	360	25.4	82	6.0	1,250	342	34.6
.....1928	1,729	4,366	6,095	1.3	4,761	796	298	24.5	76	5.6	1,166	299	37.4
Pennsylvania System.....1929	214,696	80,031	294,727	5.7	27,203	2,282	1,059	31.1	477	24.4	13,100	140	55.5
.....1928	225,128	71,233	296,361	6.2	24,178	2,088	950	29.7	415	22.2	11,353	143	49.2
Reading.....1929	28,813	13,886	42,699	3.2	21,157	1,752	868	34.7	491	23.6	14,428	161	64.9
.....1928	31,824	12,054	43,878	3.0	20,341	1,832	894	35.0	434	21.5	13,447	192	61.3
Pocahontas Region:													
Chesapeake & Ohio.....1929	29,125	11,665	40,790	3.0	33,522	2,744	1,475	43.8	1,418	58.4	21,186	100	70.1
.....1928	33,659	8,330	41,989	3.3	31,760	2,598	1,393	43.3	1,237	50.7	19,113	105	65.5
Norfolk & Western.....1929	27,172	9,956	37,128	0.9	41,971	3,109	1,658	46.2	1,386	52.6	23,076	137	69.9
.....1928	32,140	7,610	39,750	1.1	39,237	2,908	1,527	43.5	1,018	39.6	18,138	143	57.0
Southern Region:													
Atlantic Coast Line.....1929	24,136	9,973	34,109	5.0	20,913	1,475	504	19.1	367	33.1	2,430	112	51.3
.....1928	25,183	10,388	35,571	5.7	19,123	1,433	536	21.6	358	28.1	2,495	116	51.7
Central of Georgia.....1929	4,527	4,392	8,919	5.6	18,315	1,332	541	20.9	520	34.4	2,444	149	58.0
.....1928	5,605	4,941	10,546	4.2	18,540	1,325	557	22.6	462	29.0	2,565	149	56.5
Ill. Cent. (inc. Y. & M.V.).....1929	39,758	24,410	64,168	4.1	22,630	1,731	750	28.9	837	47.1	8,004	154	86.3
.....1928	44,464	19,210	63,674	6.5	23,726	1,760	752	28.1	766	44.2	7,393	143	75.8
Louisville & Nashville.....1929	41,592	19,036	60,628	9.0	17,692	1,477	708	33.5	659	33.6	7,881	161	89.0
.....1928	44,567	16,332	60,899	9.3	17,020	1,412	672	33.0	625	32.3	7,519	164	86.1
Seaboard Air Line.....1929	16,120	8,924	25,044	7.0	19,774	1,516	532	20.3	435	34.9	2,432	136	68.9
.....1928	16,812	9,154	25,966	5.4	17,466	1,420	550	22.0	389	27.7	2,253	149	60.7
Southern.....1929	49,082	18,199	67,281	8.8	19,043	1,382	555	22.7	417	28.8	4,198	169	54.8
.....1928	46,048	19,945	65,993	6.2	18,484	1,422	573	22.7	409	28.1	4,015	171	51.4
Northwestern Region:													
Chi. & North Western.....1929	45,703	31,603	77,306	6.4	17,111	1,394	532	23.5	362	25.4	3,308	166	66.9
.....1928	45,768	26,948	72,716	5.7	17,933	1,419	563	23.5	384	26.3	3,298	149	56.3
Chi., Mil., St. P. & Pac.....1929	49,304	30,303	79,607	2.9	19,375	1,601	679	25.4	508	31.4	3,593	159	73.1
.....1928	49,492	21,299	70,791	3.0	21,619	1,691	713	24.8	553	35.0	3,479	145	64.2
Chi., St. P., Minn. & Om.....1929	2,727	10,012	12,739	8.7	13,274	1,122	464	24.5	427	28.0	3,159	163	78.9
.....1928	2,543	9,306	11,849	8.0	14,494	1,152	493	24.1	454	28.4	3,120	144	66.7
Great Northern.....1929	38,859	11,096	49,955	4.6	21,584	1,820	849	27.2	498	26.5	2,973	169	51.6
.....1928	40,893	9,685	50,578	6.2	23,612	1,998	904	26.2	460	25.5	2,850	146	41.8
Minn., St. P. & S. St. M.....1929	18,474	6,054	24,528	4.2	15,320	1,332	597	24.1	415	24.8	2,338	130	71.1
.....1928	19,590	5,527	25,117	4.0	15,464	1,317	578	23.7	395	24.7	2,276	124	67.3
Northern Pacific.....1929	37,068	7,524	44,592	8.6	21,980	1,683	753	24.9	466	26.1	3,208	179	56.2
.....1928	37,918	6,860	44,778	7.8	23,446	1,822	828	24.9	467	26.0	3,259	157	46.5
Ore.-Wash. R.R. & Nav.....1929	7,343	3,805	11,148	6.6	20,619	1,653	766	27.7	508	26.1	2,523	190	58.8
.....1928	8,002	3,533	11,535	7.4	20,529	1,711	780	26.3	426	23.0	2,187	181	49.3
Central Western Region:													
Atch., Top. & S. Fe (incl. P. & S. F.).....1929	53,859	16,651	70,510	6.6	28,755	1,881	721	22.5	554	37.8	3,753	123	66.4
.....1928	57,898	14,864	72,762	6.2	27,977	1,866	712	22.1	476	32.7	3,337	123	59.2
Chicago & Alton.....1929	9,274	4,686	13,										

## News of the Week

(Continued from page 981)

passage in New Orleans in a car of the Southern and while on the Southern line in Virginia, a window screen outside of the car became loosened and, swinging backwards, broke the car window behind it, injuring the passenger with pieces of glass. The train was made up by the L. & N. and the cars composing it were furnished by three carriers on the basis of their respective mileage; and each, while in possession of the train, was in exclusive control of it. The passenger sued the L. & N. and the Southern in the federal district court for eastern Louisiana, obtaining verdict and judgment against both companies, 17 Fed. (2d) 305, which was affirmed by the Court of Appeals, Fifth Circuit, 26 Fed. (2d) 403.

1. On certiorari, the Southern alleged want of jurisdiction of the person of that corporation upon a suit in Louisiana on a cause of action arising outside the boundaries of that state.

... The Supreme Court of the United States said that the sale of the ticket was made by the L. & N. as the agent of the Southern; and in its legal effect it was the act of the Southern within the jurisdiction by which its obligation to the passenger on the contract of carriage over its own lines became complete. The fact that it had designated an agent in the state to receive service of "lawful process," under La. Act No. 184 of 1924, was held of decisive weight in determining its presence there. The question was whether the Southern's liability extended to all causes of action arising out of its corporate acts within the state, including this one. The Supreme Court decided only that, in the absence of an authoritative state decision giving a narrower scope to the power of attorney filed under the state statute, it operates as a consent to suit upon a cause of action like this, arising out of an obligation incurred within the state although the breach occurred without. The order overruling the Southern's exception to the jurisdiction was affirmed.

2. Both railroads objected to the charge of the trial court that their liability was joint, and on this point the judgment of the court was reversed and the cause remanded for a new trial. The Supreme court said, in part: "There was no basis, either in pleading or proof, for a joint liability. Neither of them was under any duty, either by the common law or statute, to assume any responsibility for the transportation of respondent beyond its own line. The L. & N., therefore might, by stipulation on the through ticket, provide that it should not be so responsible. There was no evidence of joint liability of the petitioners in the case."

There was no evidence for the jury of negligence of the L. & N. and the motion for a directed verdict in favor of that railroad should have been granted. Judgment reversed and cause remanded.—*L. & N. v. Chatters*. Decided April 15, 1929. Opinion by Mr. Justice Stone.

## Traffic

The Baltimore & Ohio has been granted permission by the Illinois Commerce Commission to abandon a northbound and a southbound train between Springfield, Ill., and Beardstown.

The Interstate Commerce Commission has re-opened its investigation of rates on cottonseed, its products and related articles for further hearing on May 17, at Atlanta, Ga., before Examiners Money and Esch. The testimony to be presented will be limited to evidence in rebuttal of the testimony and evidence relating to the transit of cottonseed presented at the hearing in these proceedings at New York city, in March. The dates fixed by the examiners, July 1, for filing the original briefs, and August 1, for filing the reply briefs, will remain as set.

A bill for an injunction to restrain the enforcement of the recent order of the Interstate Commerce Commission requiring a reduction in the refrigeration charges on fruits, vegetables, berries and melons from the South was filed in the United States district court at Norfolk, Va., on April 17 by the Atlantic Coast Line, the Baltimore & Ohio, The Florida East Coast, the Pennsylvania, the Richmond, Fredericksburg & Potomac, and the Seaboard Air Line. An order was entered convening a statutory court of three judges to hear the application at Richmond, Va., on April 23 and the commission was cited to appear at that time.

### I. C. C. Asked to Re-Open Lake Cargo Rate Case

A petition asking the Interstate Commerce Commission to reopen the lake cargo coal rate case and carry into effect its report of February 21, 1928, in which it sought to establish a 45-cent differential between the rates from the southern and northern coal fields to the lake ports, has been filed by the Eastern Ohio Coal Operators' Association.

The commission's order of February, 1928, which directed the southern roads to cancel a reduction of 20-cents a ton in their rates, was enjoined by the district court for the southern district of West Virginia, but the injunction has recently been dissolved following the holding by the Supreme Court of the United States that the case had become moot since the commission allowed the roads to establish a 35-cent differential by compromise rates effective the first of the year. The petition takes the position that the rates now in effect from the southern district, which exceed those from Ohio and Pennsylvania by 35 cents a ton, are in violation of the intent of the commission's report and that the dissolution of the injunction leaves the commission free to make a new order.

The Western Pennsylvania Coal Traffic Bureau has also asked the commission to re-open the case and to require an ad-

vance in the southern rates, stating that the compromise rates are the result of a written agreement of the carriers in violation of the expressed views of the commission.

### Further Hearing on Eastern Freight Rates

The Interstate Commerce Commission has issued a notice by Commissioner Eastman that a further hearing in connection with the eastern class rate investigation will be held at Washington on May 8 before Commissioner Eastman and Examiner Hosmer for the presentation of further evidence. The notice states that at the hearing on July 17, 1925, when the presiding commissioner suggested that a traffic test be made after the examiner's proposed report was submitted, he definitely made it part of the suggestion that at the time of the presentation of the traffic test parties to the proceeding would be given an opportunity to present further evidence if they so desired. This was overlooked at the hearing on April 12 and permission to introduce evidence was refused. It is hoped that all parties will cooperate in an effort to make the further hearing the final one and the notice says it is felt that it should reasonably be confined to the presentation, in one form or another, of revenue results which would follow if the proposed revision of eastern class rates were adopted. The date for filing exceptions to the report has been extended to May 31 and it is hoped to assign the proceeding for oral argument before the commission late in June or early in July.

### North Western to Inaugurate Rail-Air Service

The Chicago & North Western on May 1 will begin the operation of a rail-air service between middle western cities and the Black Hills of South Dakota in conjunction with the Rapid Air Lines, Inc., which will reduce the travel time between Chicago and Rapid City, S. D., by six hours. A westbound plane, leaving Huron, S. D., at 9:15 a.m. and arriving at Rapid City at 12:45 p.m., will connect with train No. 515-503 which arrives at Huron at 8:45 a.m. Eastbound a plane, leaving Rapid City at 1:30 p.m. and arriving at Huron at 5:00 p.m., will connect with Chicago, Omaha and Twin City trains which leave Huron at 7:50 p.m. and at 8:25 p.m.

Additional routes for the service, which is designed primarily to expedite summer tourist travel, will be established from Rapid City to Sheridan, Wyo., to connect with the Chicago, Burlington & Quincy; to Cheyenne, to connect with the Union Pacific; to Lemmon, S. D., to connect with the Chicago, Milwaukee, St. Paul & Pacific; and to Torrington, Wyo. Passengers will be allowed 30 lb. of free baggage and will be entitled to transportation to and from the railroad stations and the airports. The Rapid Air Lines will use in this service four-passenger Ryan Broughams, two-passenger Eagle Rock biplanes and a Ford trimotor monoplane. In connection with



the inauguration of the rail-air service South Dakota has set aside the week of April 29 to May 4 as "Into-the-Air" week and airports will be dedicated at Huron, Watertown, Pierre and Rapid City.

### I. C. C. Asked to Approve Freight Pooling Plan

The Northern Pacific and the Minneapolis, St. Paul & Sault Ste. Marie have applied to the Interstate Commerce Commission for authority to put into effect an agreement for the pooling of ore tonnage moving from the Cayuna range in Minnesota, to Superior, Wis., and also coal moving from Superior and Duluth, Minn., to the mines on the range. The plan applies to all ore shipped from that portion of the range lying north of the Northern Pacific main line. It is proposed that all of the trackage on the range, after eliminating that which will not be necessary for the economical operation of the pooled business, shall be jointly owned, used and operated.

The Northern Pacific yard at Ironton will be enlarged sufficiently to constitute a train yard for both companies. Switching on the range will be joint and each company will furnish power and crews for the joint work in the same proportion of switch engine hours as the agreed division of ore tonnage. From the joint yard at Ironton each company will operate its own road trains for the movement of ore from the range to Superior. The Soo will apply to the commission for authority to abandon some of its branch line trackage. Both companies will use the steel and concrete dock of the Northern Pacific at Superior. All ore cars will be pooled on a tonnage capacity basis, each company furnishing the same percentage of total car tonnage as its agreed division of ore tonnage. Each company will continue to furnish the general shipping public the same service as at present. Applicants desire to make their contract effective at the beginning of the 1929 ore shipping season, to continue for 99 years.

### More Time Wanted to Pay Freight Bills

Modification of the Interstate Commerce Commission's rules and regulations governing the time within which freight charges must be paid, to allow consignees a greater length of time in which to check and audit their bills before making settlement, is sought by the National Industrial Traffic League and by individual shippers in a proceeding before the commission on which hearings were begun at Washington on April 12. In a proceeding entitled Ex Parte 73, the commission prescribed rules and regulations in 1920, under which by making bonding arrangements with the carriers 96 hours will be allowed in which to settle freight bills. In ordinary cases the carriers require settlement within 48 hours. The League did not ask for any specific time, although it suggested some plan of weekly settlements, and some parties asked for ten days.

Joseph H. Beek, executive secretary of the league presented the opening testi-

mony, suggesting a plan of weekly settlements, under proper bonding arrangements. He contended that the shippers do not desire additional credit, as such, from the carriers, but that all they want is an opportunity to receive their freight bills, check the freight against them, audit the bills and pay them in the same orderly manner in which they pay other bills.

Mr. Beek was followed by various individual shippers' representatives, particularly those which receive and forward freight at branch establishments, who said that the present time limit does not afford sufficient opportunity to have the bills checked against the freight and then sent in to a main office for audit. Some claimed that so many of the freight bills contain inaccuracies that if they paid the bills without an adequate check they would be subject to many overcharges.

Alfred P. Thom, general counsel of the American Railway Association, and E. L. Copeland, secretary and treasurer of the Atchison, Topeka & Santa Fe, spoke for the railways. Mr. Copeland said that the present rules are workable and that the 96-hour arrangement gives ample time. If a longer period were allowed, he said, many shippers would delay checking their bills as many do now and the railways would need a large additional amount of working capital. He contended that very few freight bills are incorrect and that the situation has improved as indicated by the fact that on his road in 1921 corrections were made in 0.9 per cent of the freight bills issued, whereas in 1928 the percentage was only 0.67. He described some of the experiences of the collection bureau at Kansas City and said that whereas for ten years Swift & Co., had been paying its bills at that place within 24 hours it has now asked to file a bond so that it may have 96 hours. He took the position that the freight rates are on a cash basis and that to allow additional time would be to furnish credit to consignees at railroad expense.

The hearing was continued until April 24 when an adjournment was taken to June 11.

### Ask 9-ft. Channel in Upper Mississippi

Representatives of the Mississippi Valley Association and other organizations of shippers interested in barge transportation on the upper Mississippi river testified at a hearing before the Board of Engineers for Rivers and Harbors of the War Departments at Washington on April 23 and 24 in criticism of an unfavorable report recently submitted by Major C. L. Hall, district engineer at Rock Island, Ill., on the project for deepening the channel of the river between the Missouri river and Minneapolis to a depth of nine feet.

The report was submitted, following a hearing at St. Paul on January 16, pursuant to a provision in the river and harbor act of January 21, 1927, directing the secretary of War to cause preliminary examinations and surveys to be made, and recommended "that no survey

be authorized", stating "that the improvement is not worthy of undertaking to the extent of authorizing a survey." An appeal was taken to the board of engineers with a request that it recommend to the Chief of Engineers that a survey be authorized, the cost to be paid from appropriations made for such purpose. The report of the district engineer has not been made public but representatives of the organizations have been allowed access to it for the purpose of preparing their criticisms, and detailed critical analyses of it were presented at the hearing by Robert Isham Randolph, consulting engineer for the Mississippi Valley Association, and Theodore Brent, former traffic manager of the Inland Waterways Corporation, now an officer of the Redwood Line.

Mr. Randolph took the position that Congress had given specific authority and direction to make a survey and develop plans with estimates of cost, and that no such estimates had been presented; and he denied that it is possible to determine the limiting capital costs without a survey. Mr. Brent quoted the district engineer as assuming the maximum possible saving in transportation cost due to deepening the river at 2.12 mills per ton-mile, or a total of \$2,691,500 a year, while the work would cost fourteen times this amount or \$37,681,000.

The criticisms dealt with the detailed estimates of the cost of transportation but particularly with the estimates of the possible tonnage, the witnesses contending that with the amount of traffic which they predicted the costs would be greatly reduced. Mr. Brent said the engineer had evidently argued that because the economies do not immediately produce, according to his findings of available tonnage, enough savings in operating cost to amortize the whole investment, the expenditure is not warranted, and he produced estimates on various bases which he said would support an investment ranging from \$47,000,000 to \$680,000,000. Mr. Randolph also declined to admit that it is proper to charge interest and amortization to government works built out of river and harbor appropriations.

A delegation of members of Congress from the upper Missouri river states called upon the Secretary of War on April 22 to urge improvement of the Missouri river between Kansas City and Sioux City.

Herman Mueller, traffic manager of the St. Paul Chamber of Commerce, appearing also for the cities of Minneapolis and St. Paul and the Minneapolis Traffic Association, submitted an analysis of the district engineer's traffic estimates and supplemented previous testimony on the part of the associations as to the volume of traffic available for the improved waterway. He said the shippers are looking forward to the time when the government will retire from transportation business on the river and when private capital will engage in it but every day they are deprived of the savings in transportation that a nine-foot channel would afford constitutes a loss to them.

## Equipment and Supplies

### Locomotives

THE GRAND TRUNK WESTERN—See Canadian National.

THE CANADIAN NATIONAL is inquiring for 12 eight-wheel switching locomotives. These are for service on the Grand Trunk Western.

THE JAMES STONE COMPANY, Corsicana, Tex., has ordered one four-wheel switching tank locomotive from the American Locomotive Company. This locomotive will have 13 by 20 in. cylinders and a total weight in working order of 65,000 lb.

THE MONESSEN SOUTHWESTERN has ordered one six-wheel switching locomotive from the American Locomotive Company. This locomotive will have 22 by 26 in. cylinders and a total weight in working order of 166,000 lb.

THE CALUMET & HECLA CONSOLIDATED COPPER COMPANY has ordered one 2-6-0 type locomotive from the American Locomotive Company. This locomotive will have 20 by 26 in. cylinders and a total weight in working order of 170,000 lb.

THE A. M. BYERS COMPANY, Pittsburgh, Pa., has ordered one six-wheel switching tank locomotive from the American Locomotive Company. This locomotive will have 21 by 26 in. cylinders and a total weight in working order of 164,000 lb.

THE CLEVELAND UNION TERMINAL has ordered two additional 4-6+6-4 type electric locomotives weighing 408,000 lb. from the American Locomotive Company and the General Electric Company. A previous order for 20 locomotives was reported in the *Railway Age* of July 7, 1928.

THE NEW CORNELIA COPPER COMPANY has ordered three six-wheel switching locomotives from the American Locomotive Company. These locomotives will have 19 by 26 in. cylinders and a total weight in working order of 137,000 lb. This is in addition to four locomotives placed with the same builder and reported in the *Railway Age* of March 23.

THE SOUTHERN PACIFIC has ordered ten 4-8-2 type locomotives and 20 locomotive tenders of 16,000 gal. capacity from its shops at Sacramento, Cal. and Los Angeles. Inquiry for this equipment was reported in *Railway Age* of March 30. This road has also ordered one rotary snow plow from the American Locomotive Company.

### Freight Cars

THE PIEDMONT & NORTHERN is inquiring for 100 steel underframes and superstructures for box cars.

THE NORFOLK & WESTERN will build 500 all-steel automobile box cars at its Roanoke shops.

THE JOHN A. ROEBLING'S SONS COMPANY is inquiring for ten steel, high side, gondola cars of 90 tons' capacity.

THE FRUIT GROWERS EXPRESS is inquiring for 150 steel underframes for refrigerator cars.

THE BALTIMORE & OHIO has ordered 100 steel underframes for caboose cars from the American Car & Foundry Company. Inquiry for this equipment was reported in the *Railway Age* of April 13.

THE GENERAL ELECTRIC COMPANY has ordered five steel underframe flat car bodies of 50 tons' capacity, from the American Car & Foundry Company. Inquiry for two cars was reported in the *Railway Age* of January 12.

### Passenger Cars

THE CHICAGO, NORTH SHORE & MILWAUKEE is inquiring for 25 interurban cars.

THE NEW YORK CENTRAL is inquiring for 20 coach bodies and five passenger and baggage car bodies.

THE YANKTON, NORFOLK & SOUTHERN has ordered from the J. G. Brill Company one 73-ft. passenger and baggage gas-electric rail motor car.

### Machinery and Tools

THE NEW YORK CENTRAL is inquiring for a ditcher crane.

THE BALTIMORE & OHIO has ordered a 50-ton locomotive crane from the Industrial Brown Hoist Corporation.

THE MISSOURI PACIFIC has ordered from Manning, Maxwell & Moore, Inc., one Shaw 10-ton, 40-ft. span roundhouse crane to operate on circular track; available current 220 volts, 3 phase, 60 cycle, for the shops at Poplar Bluff, Mo.

### Signaling

THE MISSOURI PACIFIC has ordered from the General Railway Signal Company material for an electric interlocking plant at Broadway, Kansas City, Mo.; 23 working levers.

THE CHESAPEAKE & OHIO has ordered from the Union Switch & Signal Company material for an electro-mechanical interlocking at Catlettsburg, Ky.; 18 working mechanical levers and 12 electric.

THE TEXAS & PACIFIC has ordered from the General Railway Signal Company material for an electric interlocking plant at Mellville Drawbridge, La.; 13 working levers. Also material for the installation of automatic block signals on the line from Baird, Tex., to Big Spring, 127 miles.

## Supply Trade

**Achille P. Grenier**, St. Paul, Minn., has been appointed district manager for the state of Minnesota for the Stuebing Cowan Company, Cincinnati, Ohio.

The **Pressed Steel Car Company** has moved its Chicago office to suite 625, Peoples Gas building, 122 South Michigan avenue.

**Stanley H. Smith** has been appointed Eastern representative of the **Electric Railweld Sales Corporation**, Chicago, with headquarters at Cleveland, Ohio.

The **Symington Company** and the **Gould Coupler Company** have moved their New York City office from 250 Park avenue to the New York Central building, 230 Park avenue.

The New York office of the **Page Steel & Wire Company** has been moved from the Grand Central Terminal Building to the New York Central Building at 230 Park Avenue.

The **American Brake Shoe & Foundry Company** has moved its office from 30 Church street to the New York Central building, 230 Park avenue, New York City.

The **Whiting-Adams Company**, Boston, Mass., has established a branch sales office at 30 Church street, New York City. **Charles A. Darby, Jr.**, district sales manager is in charge of the new office.

**H. B. Spackman** has resigned as vice-president and purchasing agent of the **Lukens Steel Company**, Coatesville, Pa., and has been elected chairman of the executive committee of the board of directors; **Hugh Kenworthy**, assistant purchasing agent has been appointed purchasing agent.

The **General Cable Corporation** and the **Copperweld Steel Company** have entered into an agency agreement, whereby the General Cable Company is appointed the sole and exclusive agents in the United States to draw wire from Copperweld rods and to sell wire so drawn and wire products made therefrom.

The **Allen-Bradley Company**, Milwaukee, Wis., has opened a district office at 101 Marietta street, Atlanta, Ga. **H. Douglas Stier** and **G. G. Moore** are in charge of this southern office. **John McC. Price** has been appointed district manager in charge of the Chicago office, 500 North Dearborn street.

Negotiations for the Merger of the **Commonwealth Steel Company**, Granite City, Ill., with the **General Steel Casting Corporation**, Philadelphia, Pa., are expected to be concluded in the near future. It is understood that the directors of the Commonwealth Steel



Company have already approved the merger and that the stockholders have been asked to give their consent. **Robert H. Ripley**, senior vice-president of the American Steel Foundries has been elected also president of the General Steel Castings Corporation.

**Robbins & Myers, Inc.**, Springfield, Ohio, has organized a new hoist and crane division; the executive, technical and sales personnel of this division were all formerly associated with the Chisholm-Moore Manufacturing Company in Cleveland, in similar capacities. **Frank F. Seaman** is general manager of the division; **Carl E. Schirmer** is chief engineer; **John R. Mears** is in charge of sales; **Albert Kreh**, **William J. Scott** and **John J. Becker** are district sales managers for New York, Chicago and Detroit, respectively. The Robbins & Myers hoists, cranes and trolleys will include both hand and electric power up to 10-tons capacity.

**George A. Blackmore**, who has been elected president and general manager of the **Union Switch & Signal Company**, Swissvale, Pa., was born in 1884 at Wilkinsburg, Pa. He entered the service of the Union Switch & Signal Company in July, 1896, as an office boy. In 1901 he was made chief clerk of the engineering and estimating department at Swissvale and three years later he was transferred to New York. In March, 1909, he was appointed assistant eastern manager with headquarters at New York, and in April, 1911, became eastern manager in charge of the New York, the Montreal and the Atlanta offices.



George A. Blackmore

In this capacity he was responsible for both sales and construction work in the eastern district. In 1915 he was appointed general sales manager with headquarters at Swissvale, and in January, 1917, he was elected vice-president. On June 16, 1922, Mr. Blackmore was elected first vice-president and general manager. In April, 1925, he was elected a member of the board of directors, and on April 8, of this year, was elected president and general manager, succeeding **A. L. Humphrey** who was elected chairman of the board to take the place of the late **W. D. Uptegraff**.

## Construction

**CHICAGO, BURLINGTON & QUINCY.**—This company plans the construction of an addition to the elevator and warehouse at St. Louis, Mo., which it purchased from the Marshall Hall Grain Corporation last August. The present elevator has a capacity of 1,400,000 bu. and the addition will provide for another 1,000,000 bu.

**CITY OF ST. LOUIS.**—Plans have been prepared for the depression of the Wabash tracks through Forest Park, at a cost of \$480,000. The work is in conjunction with the River Des Peres drainage work now under way. The city plans to pay one third the cost.

**FORT WORTH & DENVER.**—This company plans the construction of a one-story brick veneer passenger and freight station, which will have outside dimensions of 248 ft. by 42 ft., at Childress, Tex., at a cost of \$80,000.

**GREAT NORTHERN.**—Major improvements being undertaken by this road involve an expenditure of \$3,334,790. These include the construction of an eight-stall addition to the roundhouse at Harve, Mont., to cost \$89,300 and a 120-ft. turntable to cost \$35,000; a 65-ft., 300-ton transfer table at Hillyard, Wash., \$33,925; a brick warehouse at Klamath Falls, Ore., \$30,000; a 50-ft. by 400-ft. frame lumber shed at Hillyard, \$29,770; a brick oil house, a metal covered frame house, scrap bins and tracks at Williston, North Dakota, \$46,800; a brick oil and paint house at Great Falls, Mont., \$21,600; water treating plants at Hannaford, N. D., \$29,150, Casselton, \$28,400 and Willman, Minn., \$38,400; a 100,000-gal. water tank at Spokane, Wash., \$7,600 and another at Tobacco, Mont., \$13,250. Second track work at Spokane and Ralston, N. D., will cost \$80,740, while passing tracks to be constructed in North Dakota, Montana and Washington will cost \$366,245. The additions to yards will necessitate the expenditure of \$309,000 at Superior, Wis., \$12,180 at Duluth, Minn., and \$51,600 at Allouez, Wis. Changes of line in Washington and Montana will cost \$455,230. In addition 51 bridges will be constructed at a cost of \$1,002,100. A gravel washing plant at Minrod, Mont., will cost \$80,000, while a snow shed at Walton, Mont., will cost \$79,900 and another on the Kalispell division, \$210,000. An addition to the bus terminal at Minneapolis will cost \$102,800.

**HOCKING VALLEY.**—The directors have authorized the construction of coal and ore handling facilities on Presque Isle, Toledo, Ohio to cost approximately \$6,000,000. The plans provide for two coal dumping machines, each with a capacity of 50 cars, of 150 tons net lading, per hour. The length of the cradle is 62 ft. Other equipment includes three stiff-leg ore machines with 17-ton buckets and a capacity of 833 tons each per hour.

Adequate storage and yard tracks, piers and docks will be provided. Work will be started immediately.

**MISSOURI PACIFIC (St. Louis, Brownsville & Mexico).**—A contract has been awarded to Cole & Pate, Hidalgo, Tex., for the grading and bridging and to William A. Smith, Houston, Tex., for the track laying and surfacing for an extension from a point south of Ed Couch, Tex., to a connection with the Hidalgo branch near Weslaco, Tex., about 10 miles. The cost of the entire construction is estimated at \$305,000. A contract for the construction of a brick and concrete addition to the freight station of the Beaumont, Sour Lake & Western at Beaumont, Tex., has been let to the King-Huff Construction Company, Beaumont.

**PENNSYLVANIA.**—This company has awarded a contract to the John F. Casey Company, Pittsburgh, Pa., for the construction of a 20-stall addition to the roundhouse, an addition to the power plant, a new machine shop and a new office building at Indianapolis, Ind. The shop building will have dimensions of 90 ft. by 135 ft. and the office building, which will serve as quarters for mechanical department officers, will have dimensions of 40 ft. by 90 ft. All buildings will be constructed of reinforced concrete brick and steel. A contract for the addition of 23,000 feet of trackage to the Hawthorne yard at Indianapolis, has been let to the T. J. Foley Company, Pittsburgh. The cost of both projects is estimated at \$500,000.

**SAN LUIS VALLEY SOUTHERN.**—The Interstate Commerce Commission has authorized this company to extend its line from its southern terminus on the Colorado-New Mexico boundary southward to a point near Questa, N. M., 18 miles; estimated cost, \$378,572.

**WESTERN PACIFIC.**—The Interstate Commerce Commission has authorized the San Francisco-Sacramento, an electric line owned by the Sacramento Northern, which in turn is a subsidiary of the Western Pacific, to construct a 0.88-mile extension in Pittsburg, Cal.; estimated cost, \$137,208.

### New York Transit Commission Announces 1929 Program

Plans involving an expenditure of approximately \$112,000,000 for the elimination of 351 grade crossings in New York City were announced recently in a report issued by the New York Transit Commission. Of these, 233 crossings have been eliminated, placed under construction or ordered, and the 1929 program, according to the report, calls for the elimination of seven more crossings at grade on the Long Island and 11 on the Staten Island Rapid Transit at a cost of approximately \$4,600,000. These former include three crossings at Edgemere and four at Glendale, L. I. and the latter 11 are involved in the Grasmere-Dongan Hills elimination project. There now remain 52 grade crossings on the Long Island and 48 on the Staten Island Rapid Transit within the boundaries of New

York City. Beginning next year, according to the report, the commission plans to more for elimination of these remaining crossings on the two roads. On the Long Island the first step will be taken in 1930 on 11 crossings in Far Rockaway at a cost of about \$1,500,000, while nine Staten Island crossings are planned for elimination at a total cost estimated at \$1,900,000. The total cost of eliminating the 100 crossings on the two roads is estimated at \$22,710,000, to be extended over a period of five years.

The total figure of expenditure in the report by the Commission also includes some 99 grade crossings on the New York Central now involved in the new West Side development. This project now awaits an agreement between the city and the railroad company on the matter of the exchange of lands and cost allocation.

#### Four Railways Plan Crossing Eliminations In Buffalo

A grade crossing elimination project involving an approximate total expenditure of \$3,000,000 for the raising of tracks and the building of subway underpasses for two streets in Buffalo N. Y., is planned jointly by the New York Central, Erie, Delaware, Lackawanna & Western and the Canadian National, together with the Grade Crossing Commission of the City of Buffalo. Grade Crossings are to be eliminated at Amherst, Austin and Tonawanda streets. It is expected that land appropriations will be sufficiently advanced by May 1 to allow for the beginning of construction work. The plan requires the appropriation of more than 80 parcels of land, necessary for approaches and street relocation. This land for the most part is occupied by buildings. The subway structures themselves will provide for the spanning of two 66 ft. streets with steel deck construction for about 36 tracks with center column supports for the bridge structure. The New York Central is now preparing plans for a temporary foot bridge and for the excavation and masonry for the two subways, while the Grade Crossing Commission of the City of Buffalo is planning for the drainage and approach work outside the railroad rights-of-way, and the paving and drainage facilities within the subways. Whether the track raising will be covered by a general contract or separately by each railway has not yet been determined. This work in general provides for the raising of tracks at these crossings about seven-and-one-half feet affecting a large area tributary to the international bridge of the Canadian National. The Erie will relocate its freight house and a new building now is under construction. The program calls for the completion of the drainage, a portion of the approach work and the raising of tracks during the working season this year. The subway excavation, drainage and paving will be completed in 1930. While Tonawanda street is included in the elimination project, a separate subway will not be provided, as it is planned to close the street for re-location so that it will pass through the Amhurst street subway.

## Financial

ANN ARBOR.—*Annual Report.*—The annual report of this company for 1928 shows net income after interest and other charges of \$471,487, equivalent, after allowing for dividend requirements on 5 per cent preferred stock, to \$8.35 a share on outstanding common stock. This compares with net income in 1927 of \$256,787, or \$1.74 a share. Selected items from the income statement follow:

	ANN ARBOR	1928	1927	Increase or Decrease
Average mileage operated .....		293.86	293.86	.....
RAILWAY OPERATING REVENUES ..		5,965,673	5,615,112	350,561
Maintenance of way .....		621,135	663,500	— 42,365
Maintenance of equipment .....		1,292,441	1,199,675	92,766
Transportation .....		2,226,531	2,194,564	31,967
TOTAL OPERATING EXPENSES .....		4,425,486	4,332,331	93,155
Operating ratio .....		74.18	77.15	— 2.97
NET REVENUE FROM OPERATIONS .....		1,540,187	1,282,781	257,406
Railway tax accruals .....		322,963	296,784	26,179
Railway operating income .....		1,216,944	985,805	231,139
Hire of Freight Cars—Dr. ....		258,270	198,387	59,882
Joint facility rents—Cr. ....		69,226	70,667	— 1,441
NET RAILWAY OPERATING INCOME .....		935,312	780,182	155,130
Non-operating income .....		25,902	22,816	3,087
GROSS INCOME .....		961,215	802,998	158,217
Interest on funded debt .....		426,971	433,769	— 6,798
TOTAL DEDUCTIONS FROM GROSS INCOME .....		489,727	546,211	— 56,484
NET INCOME .....		471,487	256,787	214,700

BALTIMORE & OHIO.—*Western Maryland Anti-Trust Case.*—This company, in a petition to the Interstate Commerce Commission for a stay of the proceedings under the Clayton law on account of its acquisition of stock of the Western Maryland, pending action by the commission on its unification application, has offered to transfer its stockholdings in the Western Maryland to a trustee approved by the commission under such terms and conditions as may be agreed upon. The case has been assigned for hearing on April 29. The petition says the Baltimore & Ohio has not exercised any control over the Western Maryland since acquiring about 40 per cent of its stock and that its application to the commission for authority to add to its system various lines including the Western Maryland, in general accord with the four-system plan, should stay the anti-trust proceedings. The Pittsburgh & West Virginia has pending an application to the commission to authorize it to acquire control of the Western Maryland on such terms as the commission may prescribe. The commission has authorized the Baltimore Chamber of Commerce and the Joint Committee of Phil-

adelphia Commercial Organizations on Consolidation of Railroads to intervene in the proceedings.

CANADIAN NATIONAL.—*Acquisition of Q. M. & S.*—Final passage was given in the House at Ottawa to the bill authorizing the Canadian National to purchase for the sum of \$6,000,000 the Quebec, Montreal & Southern Railway, a price of \$31,000 per mile.

CHICAGO GREAT WESTERN.—*Annual Report.*—The annual report of this company for 1928 shows net income after interest and other charges of \$907,812, as compared with net income in 1927 of \$400,398. Selected items from the income statement follow:

	CHICAGO GREAT WESTERN	1928	1927	Increase or Decrease
Average mileage operated .....		1,495.27	1,495.68	— .41
RAILWAY OPERATING REVENUES ..		24,871,023	24,444,753	426,270
Maintenance of way .....		3,294,815	3,374,710	— 79,895
Maintenance of equipment .....		4,357,831	4,639,132	— 281,301
Transportation .....		9,969,368	9,952,921	16,447
TOTAL OPERATING EXPENSES .....		19,426,521	19,722,210	— 295,689
Operating ratio .....		78.11	80.68	— 2.57
NET REVENUE FROM OPERATIONS .....		5,444,502	4,722,543	721,959
Railway tax accruals .....		1,076,255	1,042,859	33,397
Railway operating income .....		4,368,247	3,679,684	688,563
Hire of equipment—Dr. ....		974,562	813,779	160,783
Joint facility rents—Dr. ....		879,445	*866,623	12,822
NET RAILWAY OPERATING INCOME .....		not shown		
Non-operating income .....		1,953,885	1,979,502	— 25,618
GROSS INCOME .....		6,312,255	5,655,223	657,032
Rent for leased roads .....		78,539	*77,690	849
Interest on funded debt .....		1,705,662	1,706,221	— 559
TOTAL DEDUCTIONS FROM GROSS INCOME .....		5,410,473	5,254,825	155,648
NET INCOME .....		907,812	400,398	507,413

\* These figures are changed from those stated in report for 1927 to conform to instructions of the I. C. C. since received, so as to make the accounts of 1927 comparable with those of 1928.

CANADIAN NATIONAL.—*Annual Report.*—The annual report of this company for 1928 shows a net from railway operations of \$58,383,578 for 1928, an increase of \$12,982,888 over 1927. There was a net deficit after interest and other charges of \$24,730,410, as compared with net deficit in 1927 of \$31,576,194. Selected items from income statement follow:

	CANADIAN NATIONAL	1928	1927	Increase or Decrease
RAILWAY OPERATING REVENUES ..		276,631,921	248,716,374	27,915,547
Maintenance of way ..		48,010,559	43,174,956	3,450,169
Maintenance of equipment ..		47,918,236	44,560,390	3,357,846
Transportation .....		107,963,695	100,967,492	6,996,203
TOTAL OPERATING EXPENSES ..		218,248,344	203,315,684	14,932,660
Operating ratio .....		78.89	81.75	— 2.86



NET REVENUE FROM OPERATIONS	58,383,578	45,400,690	12,982,888
Railway tax accruals	4,998,950	4,553,238	445,712
Railway operating income	53,347,342	40,802,655	12,544,687
Hire of freight cars—Dr.	5,808,949	3,624,429	2,184,520
Joint facility rents	24,465	46,564	22,099
NET RAILWAY OPERATING INCOME	not shown		
Non-operating income	8,240,955	8,221,617	19,338
GROSS INCOME	61,454,751	49,011,341	12,443,410
Rent for leased roads	1,148,877	1,138,754	10,123
Interest on funded debt	41,655,235	40,370,452	1,284,783
TOTAL DEDUCTIONS FROM GROSS INCOME	86,185,161	80,587,535	5,597,526
NET INCOME—DEFICIT	24,730,410	31,576,194	—6,845,784

**DETROIT, TOLEDO & IRONTON.—Unified Operation.**—Examiner Ralph R. Molster has recommended to the Interstate Commerce Commission in a proposed report that it authorize this company to operate over the lines of the Detroit & Ironton under a proposed operating license, in accordance with a plan for obtaining unified operation of the properties which was devised after the commission declined to approve a consolidation of the two companies. The Detroit & Ironton was organized by the Ford interests after they had obtained control of the D. T. & I. and has taken title to various extensions which have been built. In disapproving the plan for a consolidation, which was opposed by minority stockholders of the D. T. & I., the commission suggested a lease of the properties by the D. T. & I. and the examiner recommends approval of the plan proposed as a substitute for that suggested. The report says the commission should hold that the proposed operation does not involve acquisition of control within the meaning of paragraph 2 of section 5 of the interstate commerce act. It is also recommended that the commission authorize the D. & I. to issue \$500,000 of capital stock and \$3,925,000 of first mortgage bonds.

**DULUTH & IRON RANGE.—Annual Report.**—The annual report of this company for 1928 shows net income after interest and other charges of \$1,785,505, as compared with net income in 1927 of \$1,309,624. Selected items from the income statement follow:

DULUTH & IRON RANGE			
	1928	1927	Increase or Decrease
RAILWAY OPERATING REVENUES	6,548,684	6,648,644	— 99,960
Maintenance of way	1,157,515	1,199,828	— 42,313
Maintenance of equipment	1,279,168	1,351,349	— 72,181
Transportation	1,697,320	1,853,252	—155,932
TOTAL OPERATING EXPENSES	4,418,867	4,700,892	—282,025
Operating ratio	67.48	70.70	— 3.22
NET REVENUE FROM OPERATIONS	2,129,817	1,947,752	182,065
Railway tax accruals	438,815	538,412	— 99,597

Railway operating income	1,690,965	1,409,314	281,651
Equipment and joint facility rents—Cr.	30,979	31,653	— 674
NET RAILWAY OPERATING INCOME	1,721,944	1,440,967	280,977
GROSS INCOME	2,196,964	1,911,120	285,844
Interest on funded debt	407,550	407,550	—
TOTAL DEDUCTIONS FROM GROSS INCOME	411,460	601,496	—190,036
NET INCOME	1,785,505	1,309,624	475,881

**CHICAGO & ILLINOIS WESTERN.—Equipment Trust Certificates.**—This company has applied to the Interstate Commerce Commission for authority for an issue of \$500,000 of equipment trust certificates.

**ILLINOIS CENTRAL.—Equipment Trust Certificates.**—This company has applied to the Interstate Commerce Commission for authority for an issue of \$6,990,000 of 4½ per cent equipment trust certificates, to be sold under competitive bidding to the highest bidder, subject to the approval of the commission.

**KANSAS CITY, MEXICO & ORIENT.—Securities.**—This company has applied to the Interstate Commerce Commission for authority to issue one general mortgage bond for \$4,000,000 and 30,000 shares of common stock at a par value of \$100, to be delivered to the Atchison, Topeka & Santa Fe in consideration of the surrender by that company for cancellation of \$9,116,633 of first mortgage 30-year 4 per cent bonds of the applicant.

**LOUISVILLE & NASHVILLE.—Annual Report.**—The annual report of this company for 1928 shows net income after interest and other charges of \$14,323,220, equivalent to \$12.24 a share on outstanding capital stock. This compares with net income in 1927 of \$16,726,241 or \$14.29 a share. Selected items from the income statement follow:

LOUISVILLE & NASHVILLE			
	1928	1927	Increase or Decrease
Average mileage operated	5,075.81	5,064.43	11.38
RAILWAY OPERATING REVENUES	135,638,458	144,605,117	—8,966,659
Maintenance of way	21,036,463	22,147,439	—1,110,976
Maintenance of equipment	30,408,612	32,443,885	—2,035,273
Transportation	46,993,053	50,531,905	—3,538,852
TOTAL OPERATING EXPENSES	106,231,041	112,857,835	—6,626,794
Operating ratio	78.32	78.05	.27
NET REVENUE FROM OPERATIONS	29,407,416	31,747,283	—2,339,867
Railway tax accruals	7,605,176	7,639,855	— 34,679
Railway operating income	21,782,026	24,087,731	—2,305,705
Equipment rents—Cr.	793,069	178,041	615,028
Joint facility rents—Dr.	370,042	388,938	— 18,896
NET RAILWAY OPERATING INCOME	22,205,053	23,876,834	—1,671,771
Non-operating income	3,251,675	4,075,052	— 823,377
GROSS INCOME	26,599,063	29,134,445	—2,535,382

Rent for leased roads	232,082	232,481	— 399
Interest on funded debt	10,763,747	10,893,095	— 129,348
TOTAL DEDUCTIONS FROM GROSS INCOME	12,275,843	12,408,204	— 132,361
NET INCOME	14,323,220	16,726,241	—2,403,021

**MICHIGAN CENTRAL.—Bonds.**—The Interstate Commerce Commission has authorized this company to issue \$7,634,000 of refunding and improvement mortgage bonds, Series C, to be dated January 1, 1929, and to mature 50 years thereafter. No arrangement for the sale of the bonds has been made, but the company is authorized to sell them at not less than 96 per cent of par and accrued interest. The proceeds will be used to retire a like amount of debentures which matured on April 1.

**NEW YORK CENTRAL.—Equipment Trust.**—Edward Lowber Stokes & Co. have offered \$6,300,000 of a total authorized issue of \$16,500,000 of 4½ per cent equipment trust certificates of this company dated April 15, 1929, to mature from a year hence to 1944, the proceeds of which will be used to defray a portion of the cost of 100 freight locomotives. The issue is priced to yield 4.90 per cent. This issue has been authorized by the Interstate Commerce Commission to be sold to bankers at not less than 96.84.

**NORFOLK SOUTHERN.—Annual Report.**—The annual report of this company for 1928 shows net income after interest and other charges of \$606,927, equivalent to \$3.79 a share on outstanding stock. This compares with net income in 1927 of \$740,355, or \$4.63 a share. Selected items from the income statement follow:

NORFOLK SOUTHERN			
	1928	1927	Increase or Decrease
Average mileage operated	931.52	931.78	— .26
RAILWAY OPERATING REVENUES	9,122,317	9,567,021	—444,704
Maintenance of way	1,207,794	1,202,581	5,213
Maintenance of equipment	1,282,533	1,483,413	—200,880
Transportation	3,393,154	3,570,917	—177,763
TOTAL OPERATING EXPENSES	6,543,270	6,827,969	—284,699
Operating ratio	71.73	71.37	.36
NET REVENUE FROM OPERATIONS	2,579,047	2,739,053	—160,006
Railway tax accruals	725,072	643,161	81,911
Railway operating income	1,849,899	2,093,047	—243,148
Hire of equipment—Dr.	281,581	353,782	— 72,201
Joint facility rents—Dr.	22,710	21,082	1,628
NET RAILWAY OPERATING INCOME	not shown		
GROSS INCOME	1,954,643	2,179,888	—225,245
Rent for leased roads	167,102	167,102	—
Interest on funded debt	823,801	843,099	— 19,298
TOTAL DEDUCTIONS FROM GROSS INCOME	1,347,716	1,439,533	— 91,817
NET INCOME	606,927	740,355	—133,428

(Continued on page 994)

# Annual Report

## Union Pacific Railroad Company—Thirty-Second Annual Report—Year Ended December 31, 1928

NEW YORK, N. Y., April 11, 1929.

TO THE STOCKHOLDERS OF UNION PACIFIC RAILROAD COMPANY:

The Board of Directors submits the following report of the operations and affairs of the Union Pacific Railroad Company for the calendar year ended December 31, 1928, including the Oregon Short Line Railroad Company, whose entire Capital Stock is owned by the Union Pacific Railroad Company, the Oregon-Washington Railroad & Navigation Company, whose entire Capital Stock (except fifteen qualifying shares held by Directors) is owned by the Oregon Short Line Railroad Company, and the Los Angeles & Salt Lake Railroad Company,

whose entire Capital Stock is owned, one half each, by the Union Pacific Railroad Company and the Oregon Short Line Railroad Company. For convenience, the four companies are designated by the term "UNION PACIFIC SYSTEM."

### Income

The operated mileage at close of year and income for the calendar year 1928, compared with 1927, after excluding all offsetting accounts between the Union Pacific Railroad Co., Oregon Short Line Railroad Co., Oregon-Washington Railroad & Navigation Co., and Los Angeles & Salt Lake Railroad Co., were as follows:

	Calendar Year 1928.	Calendar Year 1927.	INCREASE.	DECREASE.
<b>Operated Mileage at Close of Year.</b>				
Miles of road .....	9,857.53	9,676.81	180.72	
Miles of additional main track .....	1,547.16	1,526.31	20.85	
Miles of yard tracks and sidings .....	3,919.82	3,842.05	77.77	
<b>Total Mileage Operated .....</b>	<b>15,324.51</b>	<b>15,045.17</b>	<b>279.34</b>	
<b>Transportation Operations.</b>				
Operating revenues .....	\$215,169,245.62	\$203,891,622.46	\$11,277,623.16	
Operating expenses .....	146,256,488.06	140,334,442.20	5,922,045.86	
Revenues over expenses .....	\$68,912,757.56	\$63,557,180.26	\$5,355,577.30	
Taxes .....	15,978,221.79	15,985,844.32		\$7,622.53
Uncollectible railway revenues .....	9,647.37	17,073.98		7,426.61
<b>Railway Operating Income .....</b>	<b>\$52,924,888.40</b>	<b>\$47,554,261.96</b>	<b>\$5,370,626.44</b>	
Rents from use of joint tracks, yards, and terminal facilities .....	1,064,656.17	1,667,282.32		\$602,626.15
	\$53,989,544.57	\$49,221,544.28	\$4,768,000.29	
Hire of equipment—debit balance .....	\$7,965,912.58	\$6,954,515.26	\$1,011,397.32	
Rents for use of joint tracks, yards, and terminal facilities .....	2,204,636.96	2,783,638.76		\$579,001.80
	\$10,170,549.54	\$9,738,154.02	\$432,395.52	
<b>Net Income from Transportation Operations .....</b>	<b>\$43,818,995.03</b>	<b>\$39,483,390.26</b>	<b>\$4,335,604.77</b>	
<b>Income from Investments and Sources other than Transportation Operations.</b>				
Dividends on stocks owned .....	\$11,369,984.81	\$10,276,593.57	\$1,093,391.24	
Interest on bonds, notes, and equipment trust certificates owned .....	6,430,397.51	6,195,669.48	234,728.03	
Interest on loans and open accounts—balance .....	1,485,134.28	1,011,533.99	473,600.29	
Rents from lease of road .....	127,164.17	122,174.11	4,990.06	
Miscellaneous rents .....	612,123.23	528,587.43	83,535.80	
Miscellaneous income .....	321,754.13	301,070.99	20,683.14	
<b>Total .....</b>	<b>\$20,346,558.13</b>	<b>\$18,435,629.57</b>	<b>\$1,910,928.56</b>	
<b>Total Income .....</b>	<b>\$64,165,553.16</b>	<b>\$57,919,019.83</b>	<b>\$6,246,533.33</b>	
<b>Fixed and Other Charges.</b>				
Interest on funded debt .....	\$17,573,934.29	\$17,744,850.84		\$170,916.55
Miscellaneous rents .....	35,387.97	39,004.85		3,616.88
Miscellaneous charges .....	449,358.76	469,928.92		20,570.16
<b>Total .....</b>	<b>\$18,058,681.02</b>	<b>\$18,253,784.61</b>		<b>\$195,103.59</b>
<b>Net Income from All Sources .....</b>	<b>\$46,106,872.14</b>	<b>\$39,665,235.22</b>	<b>\$6,441,636.92</b>	
<b>DISPOSITION OF NET INCOME.</b>				
<b>Dividends on Stock of Union Pacific Railroad Co.:</b>				
Preferred stock:				
2 per cent paid April 2, 1928 .....	\$1,990,862.00	\$3,981,724.00	\$3,981,740.00	\$16.00
2 per cent paid October 1, 1928 .....	1,990,862.00			
Common stock:				
2½ per cent paid April 2, 1928 .....	\$5,557,290.00			
2½ per cent paid July 2, 1928 .....	5,557,290.00			
2½ per cent paid October 1, 1928 .....	5,557,290.00			
2½ per cent payable January 2, 1929 .....	5,557,290.00	22,229,160.00	22,229,160.00	
<b>Total Dividends .....</b>	<b>\$26,210,884.00</b>	<b>\$26,210,900.00</b>		<b>\$16.00</b>
<b>Total Appropriations of Net Income .....</b>	<b>\$26,210,884.00</b>	<b>\$26,210,900.00</b>		<b>\$16.00</b>
<b>Surplus, Transferred to Profit and Loss .....</b>	<b>\$19,895,988.14</b>	<b>\$13,454,335.22</b>	<b>\$6,441,652.92</b>	

### Operating Results for Year 1928 Compared with Year 1927

	Calendar Year 1928.	Calendar Year 1927.	INCREASE.	DECREASE.	PER CENT.
Average miles of road operated .....	9,813.48	9,677.63	135.85		1.4
<b>OPERATING REVENUES.</b>					
1. Freight revenue .....	\$169,568,273.35	\$157,745,245.71	\$11,823,027.64		7.5
2. Passenger revenue .....	26,886,972.96	28,452,380.42		\$1,565,407.46	5.5

[ADVERTISEMENT]



	Calendar Year 1928.	Calendar Year 1927.	INCREASE.	DECREASE.	PER CENT.
1. Mail revenue .....	4,680,872.46	4,343,021.79	337,850.67	.....	7.8
2. Express revenue .....	4,347,280.52	3,981,604.43	365,676.09	.....	9.2
3. Other passenger-train revenue .....	3,877,439.45	4,010,507.56	.....	133,068.11	3.3
4. Other train revenue .....	74,667.03	85,588.75	.....	10,921.72	12.8
5. Switching revenue .....	1,302,709.49	1,320,080.18	.....	17,370.69	1.3
6. Water line revenue .....	80,459.55	66,828.17	13,631.38	.....	20.4
7. Other revenue .....	4,350,570.81	3,886,365.45	464,205.36	.....	11.9
10. Total operating revenues .....	\$215,169,245.62	\$203,891,622.46	\$11,277,623.16	.....	5.5
OPERATING EXPENSES.					
11. Maintenance of way and structures .....	\$28,243,556.89	\$27,991,232.06	\$252,324.83	.....	.9
12. Maintenance of equipment .....	39,054,207.81	37,393,403.04	1,660,804.77	.....	4.4
13. Total maintenance expenses .....	\$67,297,764.70	\$65,384,635.10	\$1,913,129.60	.....	2.9
14. Traffic expenses .....	4,638,306.39	4,579,355.41	58,950.98	.....	1.3
15. Transportation expenses—rail line .....	61,713,749.85	58,373,993.60	3,339,756.25	.....	5.7
16. Transportation expenses—water line .....	61,979.82	58,560.47	3,419.35	.....	5.8
17. Miscellaneous operations expenses .....	4,679,814.51	4,400,306.53	279,507.98	.....	6.4
18. General expenses .....	7,920,081.94	7,560,762.02	359,319.92	.....	4.8
19. Transportation for investment—Credit .....	55,209.15	23,170.93	32,038.22	.....	138.3
20. Total operating expenses .....	\$146,256,488.06	\$140,334,442.20	\$5,922,045.86	.....	4.2
21. Revenues over expenses .....	\$68,912,757.56	\$63,557,180.26	\$5,355,577.30	.....	8.4
TAXES.					
22. State and county .....	\$11,433,374.14	\$11,852,812.46	.....	\$419,438.32	3.5
23. Federal income and other federal .....	4,544,847.65	4,133,031.86	\$411,815.79	.....	10.0
24. Total taxes .....	\$15,978,221.79	\$15,985,844.32	.....	\$7,622.53	—
25. Uncollectible railway revenues .....	\$9,647.37	\$17,073.98	.....	\$7,426.61	43.5
26. Railway operating income .....	\$52,924,888.40	\$47,554,261.96	\$5,370,626.44	.....	11.3
27. Equipment rents (debit) .....	7,965,912.58	6,954,515.26	1,011,397.32	.....	14.5
28. Joint facility rents (debit) .....	1,139,980.79	1,116,356.44	23,624.35	.....	2.1
29. Net railway operating income .....	\$43,818,995.03	\$39,483,390.26	\$4,335,604.77	.....	11.0
Per cent—Operating expenses of operating revenues .....	67.97	68.83	.....	.86	1.2
FREIGHT TRAFFIC.					
(Commercial Freight only)					
Tons of revenue freight carried .....	35,717,820	34,785,587	932,233	.....	2.7
Ton-miles, revenue freight .....	14,301,827,671	13,157,043,050	1,144,784,621	.....	8.7
Average distance hauled per ton (miles) .....	400.41	378.23	22.18	.....	5.9
Average revenue per ton-mile (cents) .....	1.168	1.181	.013	.....	1.1
Average revenue per freight-train mile .....	\$7.46	\$7.57	\$.11	.....	1.5
PASSENGER TRAFFIC.					
(Excluding Motor Car and Motor Coach)					
Revenue passengers carried .....	3,091,964	3,494,825	.....	402,861	11.5
Revenue passengers carried one mile .....	889,651,207	931,033,103	.....	41,381,896	4.4
Average distance hauled per passenger (miles) .....	287.73	266.40	21.33	.....	8.0
Average passengers per passenger-train mile .....	47.23	48.93	.....	1.70	3.5
Average revenue per passenger-mile (cents) .....	2.942	2.991	.....	.049	1.6
Average revenue per passenger-train mile, passengers only .....	\$1.39	\$1.46	.....	\$.07	4.8
Average total revenue per passenger-train mile .....	\$2.06	\$2.10	.....	\$.04	1.9

The increase of \$11,823,027.64 or 7.5% in "Freight Revenue" was due to an increase of 8.7 per cent in net ton miles of revenue freight carried, partially offset by a decrease of 1.1 per cent in average revenue per ton mile due in part to a 7½ per cent reduction in rates on all deciduous fruits, except apples, from California and Utah, effective February 10, 1928. There were substantial increases in the movement of grain, fresh vegetables, canned vegetables and fruits, and fresh deciduous fruits, due chiefly to: (1) large hold-overs from 1927 crops of wheat in the Northwestern States, of corn in Nebraska and Kansas and of potatoes in Idaho, and (2) increased acreage and production of vegetables and better crops of deciduous fruits in States west of the Rocky Mountains. The movement of citrus fruits decreased because of smaller orange crop. Livestock moved in greater volume principally because of favorable market prices. Business conditions generally were good throughout System territory and consequently there were increased shipments of manufactures and miscellaneous commodities, particularly automobiles and parts, and of lumber from Pacific Northwest mills, while an improved metal market resulted in a heavier movement of lead, zinc and copper from smelters in Utah, Idaho and Montana. Larger production in Kansas, Colorado and Wyoming oil fields, increased output from refineries in System territory and a greater demand for gasoline in all sections caused an increase in the transportation of petroleum and refined oils, although residual petroleum oils moved in less volume due to a lessened demand for their use in road improvements. There were decreases in the movement of stone and coal, attributable respectively to the completion during the year of breakwater at Long Beach, California, and to milder weather conditions during the winter months and termination of the miners' strike in Colorado which resulted in a reduction in long-haul shipments from Wyoming and Utah mines and a resumption of short-haul shipments from Colorado mines.

The decrease of \$1,565,407.46 or 5.5% in "Passenger Revenue" was due to decreases of 4.4 per cent in revenue passengers carried one mile and of 1.6 per cent in average revenue per passenger mile. The decrease in revenue passengers carried one mile was occasioned by the continued diversion of short-haul business to motor vehicles.

The increase of \$337,850.67 or 7.8% in "Mail Revenue" was due chiefly to an increase of approximately 15 per cent in mail pay rates effective August 1, 1928.

The increase of \$365,676.09 or 9.2% in "Express Revenue" was due principally to a substantial increase in the movement by express of carload shipments of early fruits from California and the Pacific Northwest because of improved crops.

The increase of \$464,205.36 or 11.9% in "Other Revenue" was due principally to increases in hotel and restaurant revenues because of increased travel through Southern Utah Parks, and in joint facility revenues on account of heavier movement of logs on the Camas Prairie Railroad (operated as a joint facility with the Northern Pacific), resulting from the opening for operation on January 1, 1928, of an extension from Orofino to Headquarters, Idaho, and because of increase in our proportion of earnings of certain passenger trains operated in pool service between Portland, Oregon, and Seattle, Washington (this increase was offset by decrease in earnings of other passenger trains in the pool service which are included in other accounts).

The increase of \$252,324.83 or .9% in "Maintenance of Way and Structures Expenses" was due to ordinary fluctuations in repairs and renewals.

The principal track materials used during the year in making renewals were as follows:

New steel rails.....	232.60 track miles
Second-hand steel rails.....	72.21 " "

Total..... 304.81 track miles  
excluding yard tracks and sidings, equivalent to 2.9 per cent of the track miles in main track at the beginning of the year. Ties 2,645,731 (98.3 per cent treated), equivalent to 6.8 per cent of all ties in track at the beginning of the year. Tie plates 1,515,092 and continuous rail joints 102,917.

The increase of \$1,660,804.77 or 4.4% in "Maintenance of Equipment Expenses" was due principally to heavy repairs to locomotives and freight-train cars because of increased use resulting from improvement in traffic and to retirement of obsolete locomotives and passenger cars. Freight-locomotive mileage increased 8.3 per cent and freight-train car mileage increased 12 per cent.

## General Balance Sheet—Assets

(Excluding all offsetting securities and accounts between the Union Pacific Railroad Co., Oregon Short Line Railroad Co., Oregon-Washington Railroad & Navigation Co., and Los Angeles & Salt Lake Railroad Co.)

	December 31, 1928.	December 31, 1927.	INCREASE.	DECREASE.
<b>Investments:</b>				
ROAD AND EQUIPMENT .....	\$898,463,640.88	\$885,182,950.60	\$13,280,690.28	
Less:				
Receipts from improvement and equipment fund .....	\$23,823,091.13	\$23,823,091.13		
Appropriations from income and surplus prior to July 1, 1907, credited to this account .....	13,310,236.52	13,310,236.52		
Total .....	\$37,133,327.65	\$37,133,327.65		
701. Investment in road and equipment .....	\$861,330,313.23	\$848,049,622.95	\$13,280,690.28	
702. IMPROVEMENTS ON LEASED RAILWAY PROPERTY .....		\$21,520.37		* \$21,520.37
704. DEPOSITS IN LIEU OF MORTGAGED PROPERTY SOLD .....	\$254,239.88	216,249.21	\$37,990.67	
705. MISCELLANEOUS PHYSICAL PROPERTY .....	2,104,473.34	1,968,779.50	135,693.84	
Total .....	\$2,358,713.22	\$2,206,549.08	\$152,164.14	
706. Investments in affiliated companies:				
Stocks .....	\$20,596,514.46	\$20,495,548.46	\$100,966.00	
Bonds, notes, and equipment trust certificates .....	26,549,446.13	26,078,444.69	471,001.44	
Advances .....	12,148,264.88	9,186,119.02	2,962,145.86	
Total .....	\$59,294,225.47	\$55,760,112.17	\$3,534,113.30	
707. Investments in other companies:				
Stocks .....	\$96,473,909.93	\$93,904,166.63	\$2,569,743.30	
Bonds, notes, and equipment trust certificates .....	75,891,234.76	76,627,577.36		\$736,342.60
Total .....	\$172,365,144.69	\$170,531,743.99	\$1,833,400.70	
UNITED STATES GOVERNMENT BONDS AND NOTES .....	\$32,013,361.56	\$32,013,361.56		
703. SINKING FUNDS .....	\$149,316.72	\$143,039.63	\$6,277.09	
Total Investments .....	\$1,127,511,074.89	\$1,108,704,429.38	\$18,806,645.51	
<b>Current Assets:</b>				
708. CASH .....	\$7,229,822.31	\$6,920,270.84	\$309,551.47	
709. DEMAND LOANS AND DEPOSITS .....	27,000,000.00	22,500,000.00	4,500,000.00	
710. TIME DRAFTS AND DEPOSITS .....	150,000.00		150,000.00	
711. SPECIAL DEPOSITS .....	185,316.60	75,367.44	109,949.16	
712. LOANS AND BILLS RECEIVABLE .....	6,102,131.44	6,601,102.17		\$498,970.73
713. TRAFFIC AND CAR SERVICE BALANCES RECEIVABLE .....	5,122,044.43	4,581,668.39	540,376.04	
714. NET BALANCE RECEIVABLE FROM AGENTS AND CONDUCTORS .....	1,309,889.34	1,184,377.22	125,512.12	
715. MISCELLANEOUS ACCOUNTS RECEIVABLE .....	4,456,631.99	4,181,303.04	275,328.95	
716. MATERIAL AND SUPPLIES .....	15,996,104.08	16,002,243.47		6,139.39
717. INTEREST AND DIVIDENDS RECEIVABLE .....	1,916,294.24	1,803,201.07	113,093.17	
718. RENTS RECEIVABLE .....	173,793.36	167,068.76	6,724.60	
719. OTHER CURRENT ASSETS:				
Baltimore and Ohio Railroad Co. capital stock applicable to pay- ment of extra dividend of 1914 .....	129,338.20	131,702.20		2,364.00
Miscellaneous items .....	131,950.87	51,332.00	80,618.87	
Total Current Assets .....	\$69,903,316.86	\$64,199,636.60	\$5,703,680.26	
<b>Deferred Assets:</b>				
720. WORKING FUND ADVANCES .....	\$76,076.13	\$67,643.09	\$8,433.04	
722. OTHER DEFERRED ASSETS:				
Land contracts, as per contra .....	48,414.39	62,378.08		\$13,963.69
Miscellaneous items .....	3,619,868.86	3,758,629.44		
Total Deferred Assets .....	\$3,744,359.38	\$3,888,650.61		\$144,291.23
<b>Unadjusted Debits:</b>				
723. RENTS AND INSURANCE PREMIUMS PAID IN ADVANCE .....	\$7,253.01	\$4,170.96	\$3,082.05	
725. DISCOUNT ON FUNDED DEBT .....	1,016,850.92	1,048,544.96		\$31,694.04
727. OTHER UNADJUSTED DEBITS .....	1,532,008.94	1,268,762.00	263,246.94	
Total Unadjusted Debits .....	\$2,556,112.87	\$2,321,478.52	\$234,634.35	
Grand Total .....	\$1,203,714,864.00	\$1,179,114,195.11	\$24,600,668.89	

\* Transferred to account 701.

The increase of \$3,339,756.25 or 5.7% in "Transportation Expenses—Rail Line" was due principally to increases in engine and train crews and station forces, and in quantities of fuel consumed by locomotives, resulting from an increase of 2.7 per cent in tons of revenue freight hauled and of 11.1 per cent in freight gross ton miles, and to an increase of approximately \$1,450,000 in wage schedules of enginemen, trainmen and station employees.

The increase of \$279,507.98 or 6.4% in "Miscellaneous Operations Expenses" was due principally to increased operations of hotels in Southern Utah Parks area.

The increase of \$359,319.92 or 4.8% in "General Expenses" was due principally to increases in wages, pension payments and premiums on employees' group insurance.

An analysis by classes of the net decrease of \$7,622.53 in "Taxes" is shown in the table. The decrease in State and county taxes resulted from decreases in several States in both assessments and tax levies. The increase in Federal income and other Federal taxes was due to increase in taxable income, partially offset by a decrease in the income tax rate from 13½ to 12 per cent under the "Revenue Act of 1928."

The increase of \$1,011,397.32 or 14.5% in "Equipment Rents (Debit)" was due chiefly to increase of 15.5 per cent in mileage payments on refrigerator cars, there having been a substantial increase in number of carloads of perishable commodities handled.

The increase in "Investment in Road and Equipment" is made up as follows:

Extensions and Branches .....	\$2,292,028.92
Additions and Betterments, excluding Equip- ment .....	8,491,755.62
Equipment .....	6,029,755.52
Total Increase .....	\$16,813,540.06

From which there was deducted:

Cost of property retired from service and not to be replaced .....	\$208,244.40
Cost of real estate retired .....	12,076.68
Cost of equipment retired from service .....	3,312,528.70

Total Deductions .....

3,532,849.78

Net increase in "Investment in Road and Equipment" .....

\$13,280,690.28

The North Platte Cut-off, approximately 54 miles, between Egbert, Wyoming, on the main line 32 miles east of Cheyenne, and Creighton, Wyoming, near the westerly end of the North Platte Branch, which will provide a shorter route from the west and south to points on the North Platte Branch, and also develop new territory in southern Wyoming, of which part is



General Balance Sheet—Liabilities

(Excluding all offsetting securities and accounts between the Union Pacific Railroad Co., Oregon Short Line Railroad Co., Oregon-Washington Railroad & Navigation Co., and Los Angeles & Salt Lake Railroad Co.)

	December 31, 1928.	December 31, 1927.	INCREASE.	DECREASE.
751. Capital Stock:				
Common stock	\$222,293,100.00	\$222,293,100.00		
Preferred stock	99,543,100.00	99,543,500.00		\$400.00
Total Capital Stock	\$321,836,200.00	\$321,836,600.00		\$400.00
755. Funded Debt	409,356,215.00	411,317,075.00		1,960,860.00
Total	\$731,192,415.00	\$733,153,675.00		\$1,961,260.00
754. Grants in Aid of Construction	\$756,688.08	\$395,596.73	† \$361,091.35	
Current Liabilities:				
759. TRAFFIC AND CAR SERVICE BALANCES PAYABLE	\$1,805,897.68	\$1,731,091.66	\$74,806.02	
760. AUDITED ACCOUNTS AND WAGES PAYABLE	11,025,835.40	11,850,172.26		\$824,336.86
761. MISCELLANEOUS ACCOUNTS PAYABLE:				
Due to affiliated companies	16,938,938.09	12,884,974.17	4,053,963.92	
Other accounts payable	238,015.58	170,335.01	67,680.57	
763. DIVIDENDS MATURED UNPAID:				
Coupons matured, but not presented	158,852.29	137,031.59	21,820.70	
Coupons and interest on registered bonds, due first proximo	4,516,507.40	5,116,439.00		\$599,931.60
763. DIVIDENDS MATURED UNPAID:				
Dividends due but uncalled for	123,881.50	129,942.50		6,061.00
Extra dividend on common stock declared January 8, 1914, payable to stockholders of record March 2, 1914, unpaid	139,424.24	141,819.63		2,395.39
Dividend on common stock payable second proximo	5,557,290.00	5,557,290.00		
764. FUNDED DEBT MATURED UNPAID	133,900.00	136,400.00		2,500.00
766. UNMATURED INTEREST ACCRUED	1,715,793.77	1,668,114.16	47,679.61	
767. UNMATURED RENTS ACCRUED	550,318.95	482,164.70	68,154.25	
768. OTHER CURRENT LIABILITIES	174,368.09	153,152.41	21,215.68	
Total Current Liabilities	\$43,079,022.99	\$40,158,927.09	\$2,920,095.90	
Deferred Liabilities:				
770. OTHER DEFERRED LIABILITIES:				
Principal of deferred payments on land contracts, as per contra	\$48,414.39	\$62,378.08		\$13,963.69
Contracts for purchase of real estate	1,660,000.00	1,660,000.00		
Miscellaneous items	7,932,045.80	7,903,882.93	\$28,162.87	
771. TAX LIABILITY	10,216,998.90	9,879,165.77	337,833.13	
Total Deferred Liabilities	\$19,857,459.09	\$19,505,426.78	\$352,032.31	
Unadjusted Credits:				
773. INSURANCE RESERVE:				
Reserve for fire insurance	\$3,303,755.81	\$2,863,207.16	\$440,548.65	
776. RESERVE FOR DEPRECIATION	69,313,093.01	65,140,992.96	4,172,100.05	
778. OTHER UNADJUSTED CREDITS:				
Contingent interest	678,366.09	678,366.09		
Miscellaneous items	2,903,226.05	3,140,527.88		\$237,301.83
Total Unadjusted Credits	\$76,198,440.96	\$71,823,094.09	\$4,375,346.87	
Total Liabilities	\$871,084,026.12	\$865,036,719.69	\$6,047,306.43	
Surplus:				
APPROPRIATED FOR ADDITIONS AND BETTERMENTS	\$30,373,965.02	\$30,309,935.20	† \$64,029.82	
RESERVED FOR DEPRECIATION OF SECURITIES	34,972,570.88	34,972,570.88		
FUNDED DEBT RETIRED THROUGH INCOME AND SURPLUS	536,828.66	536,828.66		
SINKING FUND RESERVES	152,221.43	145,239.43	6,982.00	
Total Appropriated Surplus	\$66,035,585.99	\$65,964,574.17	\$71,011.82	
784. Profit and Loss—Credit Balance	234,922,375.67	216,440,025.03	18,482,350.64	
Total Surplus	\$300,957,961.66	\$282,404,599.20	\$18,553,362.46	
As this consolidated balance sheet excludes all intercompany items, securities of the Los Angeles & Salt Lake Railroad Company owned by other System companies are not included. The difference between the par and face value of such securities as carried on the books of the Los Angeles & Salt Lake (less unextinguished discount on the bonds and discount charged to Profit and Loss but added back in consolidating the accounts) and the amounts at which the securities are carried on the books of the owning System companies is set up here to balance	\$31,672,876.22	\$31,672,876.22		
Grand Total	\$1,203,714,864.00	\$1,179,114,195.11	\$24,600,668.89	

† These amounts respectively represent donations made during the year by Federal Government, States, counties and municipalities and by individuals and companies in part payment for improvements, such as road crossings, drainage projects, and industry spur tracks, the cost of which was charged to "Investment in Road and Equipment." These amounts are so accounted for to conform with regulations of the Interstate Commerce Commission.

a rich agricultural region and the remainder well adapted to the raising of livestock, as mentioned in last year's report, was completed and placed in operation September 27, 1928.

In 1926 the Oregon-Washington Railroad & Navigation Company and the Northern Pacific Railway Company arranged for the construction of a line of railroad from Orofino, Idaho, on a branch of the Northern Pacific, a distance of 41 miles to a point called Headquarters, Idaho, to serve an extensive and hitherto undeveloped territory containing approximately 10,400,000 feet of white pine timber and about 70 square miles of pasture and agricultural land, approximately 56% of the timber being owned by the Clearwater Timber Company (Weyerhaeusers). It was agreed that the Northern Pacific should construct and own the line and that the O-W. R. & N. should be granted joint and equal use thereof and, in order that the O-W. R. & N. might avail itself of this right, that it be granted also joint and equal use of the Northern Pacific line between Spalding and Stites, Idaho, approximately 66 miles; these lines to be included, for operation for joint account of the O-W. R. & N. and the Northern Pacific by the Camas Prairie Railroad Company (jointly owned), with the O-W. R. & N. line between Riparia, Washington, and Lewiston, Idaho, and the

Northern Pacific line between Lewiston and Grangeville, Idaho, so operated since 1909. The Clearwater Timber Company constructed at Lewiston a lumber mill with an annual capacity of 200,000,000 feet B.M. Logs are transported from the new line to Lewiston and the lumber manufactured there is shipped via the O-W. R. & N. and the Northern Pacific. The new line was completed and placed in operation on January 1, 1928.

An issue of \$20,000,000 face value debenture bonds, known as Union Pacific Railroad Company Forty-Year Four Per Cent Gold Bonds, was made under an indenture dated June 1, 1928, and sold on that date for the purpose of retiring and refunding \$20,000,000 face value of Union Pacific Railroad Company Ten Year Six Per Cent Secured Gold Bonds which matured on July 1, 1928. These bonds mature on June 1, 1968, and bear interest at the rate of four per cent per annum from June 1, 1928, payable semi-annually on June 1 and December 1 in each year. They are redeemable as a whole only, upon not less than sixty days' previous notice, on June 1, 1933, or any semi-annual interest date thereafter, at their principal amount and accrued interest to the date designated for redemption. The discount and expense incident to the sale of these bonds was charged to Profit and Loss.

[ADVERTISEMENT]

## Financial News

(Continued from page 989)

**PENNSYLVANIA.—Investment Trust.**—The directors of this company have incorporated in Delaware the Pennroad Corporation, an investment company with broad powers, among others to invest in any corporation or other agency including those engaged in transportation of any description on land, water, or by air, excepting railroads. It is not the present intention for the new corporation to acquire existing investments of the Pennsylvania Company in other railroads. The new company will have an authorized issue of 10,000,000 shares of common stock without par value of which 5,800,000 shares will be immediately offered to stockholders of the Pennsylvania Railroad each holder of two shares in the latter being eligible to subscribe to one share in the new company at \$15. In order to insure continuity of management in harmony with the interests of the Pennsylvania Railroad all the stock issued will be placed in a voting trust with W. W. Atterbury, Effingham B. Morris and Jay Cooke as voting trustees. **Increased dividend.**—The directors have raised the dividend from \$3.50 per \$50 share to \$4.

**RICHMOND, FREDERICKSBURG & POTOMAC.—Annual Report.**—The annual report of this company for 1928 shows net income after interest and other charges of \$1,840,233, as compared with net income in 1927 of \$1,709,754. Selected items from the income statement follow:

RICHMOND, FREDERICKSBURG & POTOMAC			
	1928	1927	Increase or Decrease
RAILWAY OPERATING REVENUES	11,035,433	11,595,722	—560,289
Maintenance of way	1,213,918	1,414,940	—201,022
Maintenance of equipment	1,909,382	2,027,984	—118,602
Transportation	3,862,207	4,143,252	—281,045
TOTAL OPERATING EXPENSES	7,800,240	8,438,157	—637,917
Operating ratio	70.68	72.77	—2.09
NET REVENUE FROM OPERATIONS	3,235,193	3,157,565	77,628
Railway tax accruals	618,419	669,451	—51,032
Railway operating income	2,616,546	2,488,047	128,499
Hire of equipment—Dr.	461,935	486,801	—24,866
Joint facility rents—Dr.	142,732	125,599	17,133
NET RAILWAY OPERATING INCOME	2,011,879	1,875,647	—136,232
Non-operating income	192,321	210,957	—18,636
GROSS INCOME	2,204,200	2,086,603	117,597
Interest on funded debt	350,723	356,345	—5,622
TOTAL DEDUCTIONS FROM GROSS INCOME	363,967	376,849	—12,882
NET INCOME	1,840,233	1,709,754	130,479
Surplus for year carried to profit and loss	1,840,233	1,709,754	130,479

**SLIGO & EASTERN.—Abandonment.**—This road has applied to the Missouri Public Service Commission for permission to abandon service on the 33 miles of road in Iron and Crawford counties. The petition states that the road has been operating at a loss since 1921 as a

result of the shutdown of the Sligo Furnace Company and the fact that all of the timber in that region has been cut.

**SOUTHERN PACIFIC.—Abandonment.**—The Interstate Commerce Commission has authorized the Houston & Texas Central and the Texas & New Orleans to abandon a portion of the line extending from Waco to a point near Ross station, Tex., approximately 7.5 miles.

**SOUTHERN.—Anti-Trust Case.**—The Interstate Commerce Commission has assigned the company's motion that it dismiss its Clayton law complaint against the Southern for acquisition of control of the Mobile & Ohio and the New Orleans & Northeastern for argument on May 11.

**SOUTHERN.—Asks Dismissal of Anti-Trust Complaint.**—This company has filed with the Interstate Commerce Commission a motion for a dismissal of the complaint recently issued by the commission alleging violation of section 7 of the Clayton law in the acquisition of stock of the Mobile & Ohio and the New Orleans & Northeastern. The Southern says that the acquisition of control of the Mobile & Ohio was in the year 1901, many years before the enactment of the Clayton law, and that the law is not retroactive. To require the Southern to divest itself of all interest in the stock or bonds of the Mobile & Ohio, it says, would be to impair a right acquired prior to the passage of the Clayton act and contrary to the express terms of part of the act. It is also contended that the second count of the complaint, referring to the acquisition of the N. O. & N. E. is based upon a paragraph of the law directed against the acquirement of stock in two or more corporations, and that the N.O.&N.E. is so located as to be a necessary feeder to its lines and is therefore within the exemptions of paragraph 4 of section 7 of the Clayton act.

**ST. LOUIS-SOUTHWESTERN.—Control.**—New York Investors, Inc., an investment trust, is reported to have acquired the stock of this company which was held by the Kansas City Southern.

**SOUTHERN PACIFIC.—Securities.**—The Interstate Commerce Commission has authorized this company to issue \$65,166,000 of 4½ per cent bonds of 1929, the bonds to be offered at 94 per cent to the company's stockholders. Kuhn, Loeb & Co., will purchase any portion of bonds not acquired by the stockholders at the same price, the underwriting charge to be 2½ per cent, which will make the average annual cost to the railroad 4.993 per cent. The commission has likewise authorized the company to issue \$19,549,800 of common stock, the stock to be sold at not less than par. The bonds to be issued will bear warrants entitling the purchaser to purchase common stock at \$145 a share at any time prior to May 1, 1934, the purchase price to be subject to reduction in the case of an additional issue of common stock at less than this price or of an intervening stock dividend. The ratio will be three shares of \$100 par stock for each \$1,000 bond. The bond issue will provide the company with funds to meet maturing obligations and to re-

imburse itself for expenditures made in acquiring control of the Houston & Texas Central, the Texas Midland, and the Northwestern Pacific. The proceeds from the sale of the stock must be set aside in a special fund and not disbursed until the commission's approval is secured.

**TOLUCA & ZITACUARO.—Directors Elected.**—The stockholders of this company at a meeting at Mexico City, Mex., elected the following directors: Jesus Zermeno, president and general manager; Manuel Zermeno, vice-president; Rafael C. Zermeno; Adolfo Zermeno, and Francisco Lopez Hinojosa.

**VICKSBURG, SHREVEPORT & PACIFIC.—Bonds.**—The Interstate Commerce Commission has authorized an issue of \$1,845,000 of refunding and improvement mortgage bonds, to be delivered at par to the Yazoo & Mississippi Valley in reimbursement of funds advanced for the redemption of outstanding bonds of the V. S. & P.

**WABASH.—Annual Report.**—The annual report of this company for 1928 shows net income after interest and other charges of \$6,401,277, equivalent to \$4.21 a share on outstanding common stock. This compares with net income in 1927 of \$4,763,610, or \$1.76 a share. Selected items from the income statement follow:

WABASH			
	1928	1927	Increase or Decrease
Average mileage operated	2,524.20	2,524.20	.....
RAILWAY OPERATING REVENUES	71,072,991	67,108,154	3,964,838
Maintenance of way	9,496,663	9,340,820	155,843
Maintenance of equipment	11,815,469	11,880,995	—65,527
Transportation	26,784,643	25,924,499	860,144
TOTAL OPERATING EXPENSES	52,411,568	51,379,147	1,032,421
Operating ratio	73.74	76.56	—2.82
NET REVENUE FROM OPERATIONS	18,661,423	15,729,007	2,932,417
Railway tax accruals	3,052,357	2,787,695	264,662
Railway operating income	15,595,400	12,931,640	2,663,760
Hire of Freight Cars—Dr.	2,171,711	1,933,814	237,897
Joint facility rents	1,482,332	1,395,391	86,941
NET RAILWAY OPERATING INCOME	11,950,039	9,611,677	2,338,362
Non-operating income	1,635,856	1,981,198	—345,342
GROSS INCOME	13,585,895	11,592,875	1,993,020
Rent for leased roads	363,634	364,948	—1,314
Interest on funded debt	5,936,101	5,496,348	439,761
TOTAL DEDUCTIONS FROM GROSS INCOME	7,184,618	6,829,265	355,353
NET INCOME	6,401,277	4,763,610	1,637,667

### Average Prices of Stocks and of Bonds

	Apr. 23	Last week	Last year
Average price of 20 representative railway stocks	131.57	129.85	121.87
Average price of 20 representative railway bonds	91.79	91.60	96.40

### Dividends Declared

Cincinnati, Sandusky & Cleveland.—Preferred, \$1.50, payable May 1 to holders of record April 16 to May 1.  
Georgia Southern & Florida.—First and Second Preferred, 2½ per cent, payable May 23 to holders of record May 9.  
International Railways of Central America.—Preferred, 1¼ per cent, quarterly, payable May 15 to holders of record April 30.



## Officers

### Executive

**J. M. Hood**, general superintendent of the Akron, Canton & Youngstown, has been elected vice-president in charge of operation, with headquarters as before at Akron, Ohio.

**James B. Yohe**, vice-president of the Pittsburgh & Lake Erie, with headquarters at Pittsburgh, Pa., will retire from the service of that road on May 1. He will be succeeded by **Curtis M. Yohe**, assistant to the president, with headquarters at the same point.

**Jesus Zermeno** has been elected president and general manager of the Toluca & Zitacuaro, with headquarters at Mexico City, Mex. **Manuel Zermeno** has been elected vice-president, with headquarters at the same point. Other officers, all with headquarters at Mexico City, are: **Manuel Dominguez**, auditor; **Salvador Ramirez Escamilla**, assistant auditor; **Narciso Bassols**, general attorney, and **Luis Ibarra Landero**, secretary.

**R. T. Morrow**, assistant to the vice-president, central region, of the Pennsylvania has retired after almost 52 years in the service of the company. Born March 2, 1859, at Oswego, N. Y., he was educated at Lehigh University, and entered railway service at the shops of the Northern Central (now a part of the Pennsylvania). In 1882 he became rodman for the Philadelphia and Erie (also a part of the Pennsylvania), a year later becoming assistant supervisor of the same road, and in 1885 supervisor of the eastern division of the road. He was then successively from 1891 supervisor of the Pennsylvania at Altoona, Pa.; assistant engineer, middle division, Philadelphia & Erie; assistant engineer, Northern Central, at Elmira, N. Y.; assistant engineer, Pittsburgh division of the Pennsylvania, with headquarters at Pittsburgh, Pa.; assistant superintendent of the same division; superintendent of the Western Pennsylvania division of the same road; superindendent, Pittsburgh division and division superintendent, Central region, of the Pennsylvania with headquarters at Pittsburgh. From this position he was appointed assistant to the vice-president, which position he held at the time of his retirement on April 1.

**William Wyer**, who was recently appointed vice-president, assistant secretary and assistant treasurer of the International-Great Northern and the San Antonio, Uvalde & Gulf, has also been elected vice-president of the Denver & Rio Grande Western and the Gulf Coast Lines, with headquarters at New York. He has also been elected a director of the Missouri Pacific, the

Gulf Coast Lines and the Texas & Pacific. Mr. Wyer was born on April 3, 1895, at Concordia, Kan. He was educated at the Albany Academy for Boys, Albany, N. Y., Yale University, and the Massachusetts Institute of Technology. While a student at the latter institution, Mr. Wyer also completed the railway transportation courses of the Harvard Graduate School of Business Administration. He first entered railway service with the United States Railroad Administration in January, 1919, and served in various capacities until he became assistant to the comptroller in charge of maintenance accounts, remaining with the administration until September, 1920. He next served with the Norfolk Southern as assistant superintendent of transportation and later entered the service of the Denver & Rio Grande Western as statistician to the president. On January 1, 1929, Mr. Wyer was appointed assistant to the president of the Denver & Rio Grande Western, with headquarters at Denver, Colo., serving in that capacity until March 1, when his recent appointments became effective.

### Financial, Legal and Accounting

**Bowman Jarrott**, claim agent of the Panhandle & Santa Fe, has been promoted to general claim agent, with headquarters as before at Amarillo, Tex.

**E. A. Boyd**, general attorney of the Kansas City, Mexico & Orient, with headquarters at Wichita, Kan., has been appointed commerce attorney for the Atchison, Topeka & Santa Fe, with headquarters at Chicago. **Gerald E. Duffy**, attorney for the Santa Fe at Chicago, has been promoted to commerce attorney at the same point.

### Operating

**C. F. Strickland** has been appointed superintendent of the Pecos division of the Panhandle & Santa Fe, with headquarters at Pecos, N. M.

**Frank B. Kraus** has been appointed assistant trainmaster of the Fort Wayne division of the Pennsylvania at Fort Wayne, Ind.

**E. C. Pearce**, assistant trainmaster on the Sacramento division of the Southern Pacific at Truckee, Cal., has been promoted to trainmaster on the Salt Lake division at Carlin, Nev.

**R. F. McCaslin** has been appointed inspector of passenger transportation of the Missouri Pacific, with supervision over passenger train service and passenger train and passenger station employees, with headquarters at St. Louis, Mo.

**E. A. Sollitt**, general superintendent of the western district of the Wabash, with headquarters at St. Louis, Mo., has been appointed general superintendent of the eastern district with the same headquarters to succeed **T. J. Jones**, who has been granted a leave of absence to serve on the Southwest Train Service Regional Board of Adjustment, and will be succeeded by **W. W. Greenland**, superintendent at Moberly, Mo., who in turn will be succeeded by **R. A. Messmore**.

**C. E. Urbahns**, who has been appointed general manager of the Duluth, South Shore & Atlantic and the Mineral Range, was born on November 3, 1870, at Valparaiso, Ind. He entered railway service on September 1, 1885, as a telegraph operator for the New York, Chicago & St. Louis. From December 1, 1891, to May 23, 1902, he was a train dispatcher and from the latter date to April 1, 1904, he was night chief train dispatcher. On the latter date he became chief train dispatcher for the Wisconsin Central at Fond du Lac, Wis., which position he held until Janu-



C. E. Urbahns

ary 1, 1906, when he was promoted to trainmaster. On April 26, 1907, he was promoted to assistant superintendent on this road and continued in that position with the Minneapolis, St. Paul & Sault Ste Marie, after it absorbed the Wisconsin Central. On April 10, 1911, he was promoted to superintendent at Stevens Point, Wis., and on May 1, 1920, he was advanced to general superintendent with headquarters at Minneapolis, Minn., which position he held until his recent appointment.

### Traffic

**W. R. St. John** has been appointed general agent of the freight department of the Delaware & Hudson at St. Louis Mo., succeeding **J. B. Stewart**.

**John M. Rolin** has been appointed district passenger agent of the Reading,

with headquarters at Williamsport, Pa., succeeding **George O. Roper**, retired.

**F. H. Dowling**, soliciting freight agent of the Missouri-Kansas-Texas, has been promoted to district freight agent with headquarters at Minneapolis, Minn.

**Roy R. Scott**, who has been connected with the freight traffic department of the Southern Pacific at Chicago, has been promoted to general agent of perishable freight traffic at San Francisco.

**C. P. Wilcox** has been appointed acting district passenger agent of the Wabash, with headquarters at Dallas, Tex., to succeed **J. A. Harlow**, who has been granted a leave of absence because of illness.

**L. E. Clarhan**, industrial agent of the Wabash, has been promoted to general industrial agent, with headquarters as before at St. Louis, Mo. **W. W. Ropa**, as been appointed industrial agent to succeed Mr. Clarhan.

**L. C. Bouchard** has been appointed general freight and passenger agent of the Southern Pacific Lines in Texas and Louisiana in charge of solicitation in the territory embracing Dallas, Tex., Waco and Fort Worth, and with headquarters at Dallas. **W. E. Briggs**, assistant general freight and passenger agent at Dallas, has been appointed assistant industrial commissioner, with headquarters at the same point.

**John A. Streyer**, traffic manager of the American Short Line Railroad Association, for Southern Classification Territory, has been appointed general traffic manager of the association, with office at Atlanta, Ga., as heretofore. **E. D. Bailey**, who has been his assistant, has been appointed assistant traffic manager, for southeastern territory, with office at Atlanta, and **J. A. Demeke**, heretofore traffic manager of the Gideon & North Island, has been appointed assistant traffic manager of the association at Chicago.

**Henry George Kaill**, general freight agent of the Union Pacific System, with headquarters at Kansas City, Mo., who voluntarily retired from active duty on April 1, because of ill health, had been in railway service at Kansas City for nearly 52 years. More than 45 years of his railroad career were spent in the service of the Union Pacific. Mr. Kaill was born in London, England, on February 5, 1864, and attended the public schools of Kansas City, entering railway service at the age of 13 years with the Missouri Pacific in the latter city. He was appointed soliciting freight agent on the Union Pacific on December 18, 1883, and eight years later he was advanced to general agent. On September 1, 1901, Mr. Kaill was promoted to assistant general freight and passenger agent, then being further promoted to general freight and passenger agent on November 1, 1911. On March 1, 1920, upon the return of the railroads to private operation, and the separation of the freight and passenger departments

at Kansas City, his title was changed to general freight agent, a position he held until his retirement.

## Engineering, Maintenance of Way and Signaling

**George H. Seitz** has been appointed resident engineer of the Reading, with headquarters at Reading, Pa., succeeding **Paul Voorhees**.

**T. P. Rollow, Jr.**, has been appointed division engineer of the Northern division of the Gulf, Colorado & Santa Fe, with headquarters at Cleburne, Tex., succeeding **W. G. Massenburg**, deceased.

**Edwin F. Dawson**, resident engineer of the Reading, with headquarters at Philadelphia, Pa., retired from active service on April 1, after having served for 47 years in the engineering department of that road. **Walter Sebastian** succeeds Mr. Dawson as resident engineer at Philadelphia.

**F. P. Sisson**, division engineer of the Grand Trunk System, has been promoted to principal assistant engineer, with headquarters as before at Detroit, Mich. **A. N. Laird**, assistant engineer at Detroit, has been promoted to bridge engineer, with headquarters at the same point.

**Lyde A. Henry**, who has been promoted to landscape engineer of the Missouri Pacific Lines, with headquarters at St. Louis, Mo., was born on July 1, 1893, in Arkansas. He was graduated from high school in 1908 and thereafter completed one year of college work, entering railway service on October 12, 1912, as a rodman on the Missouri Pacific. From April, 1913, to October, 1920, Mr. Hyde served with private engineering firms and the United States Engineers Corps in various capacities from rodman to resident engineer, engaging in drainage, road building and river protection work in Arkansas and Louisiana. He then returned to railway service as an instrumentman on the Memphis division of the Missouri Pacific at Wynne, Ark., and in September, 1921, he was transferred to the office of the engineer of public improvements at Little Rock, Ark. In March, 1924, he was promoted to sanitary inspector at Little Rock, a position he held until his further promotion to landscape engineer, with headquarters at St. Louis.

## Mechanical

**R. V. Blocker**, mechanical superintendent of the Erie, with headquarters at Meadville, Pa., has been appointed assistant superintendent of motive power, with headquarters at Hornell, N. Y. **George Thibaut**, assistant mechanical superintendent, with headquarters at Jersey City, N. J., has been appointed district master mechanic, with headquarters at Seacucus, N. J. **F. H. Murray**, mechanical superintendent at Hornell, N.

Y., has been appointed district master mechanic at that point. **W. A. Carlson**, general master mechanic, with headquarters at Hornell, N. Y., has been appointed district master mechanic at Meadville, Pa. The positions of mechanical superintendent, assistant mechanical superintendent and general master mechanic have been abolished.

## Purchases and Stores

**F. S. Shinn**, chief lumber inspector of the Chicago, Burlington & Quincy with headquarters at Chicago has resigned to become special representative of the Curtin Howe Corporation effective May 1.

**C. H. Vandegrift** has been appointed division storekeeper on the Albuquerque division of the Atchison, Topeka & Santa Fe at Gallup, N. M., succeeding **A. M. McHenry**, who has been transferred to Winslow, Ariz.

## Special

**J. L. Gibson** has been appointed courtesy instructor of the Union Pacific with headquarters at La Grande, Ore.

## Obituary

**T. A. Sherwood**, traveling freight auditor of the Wabash with headquarters in Buffalo, N. Y., died in St. Louis, Mo., on April 15.

**William A. Roe**, manager of the Lackawanna Terminal Warehouses, Inc., died suddenly on April 27 at St. Joseph's Hospital, Paterson, N. J.

**Martin Devney**, superintendent of the St. Louis and Henderson divisions of the Louisville & Nashville, who died at Evansville, Ind., on April 10, was born in England in 1862. He came to Middlesboro, Ky., at an early age and entered railway service in 1880 as a telegraph operator on the L. & N. Later he was advanced to assistant train dispatcher and after serving in that capacity for seven years he was advanced to trainmaster at Henderson, Ky. In 1902 Mr. Devney was promoted to assistant superintendent at Evansville, then being further promoted to superintendent of the St. Louis and Henderson divisions in 1921.

THE SOUTHERN PACIFIC, on May 1, will establish a passenger train, the "Klamath" between San Francisco, Cal., and Portland, Oregon, the fifth through daily train carrying Pullmans on the San Francisco-Portland run. The "Klamath" will leave San Francisco at 7 p. m. daily, arriving in Klamath Falls at 9:10 a. m. the following morning, and reaching Portland at 6:20 p. m. that day. Southbound the train will depart from Portland at 8:30 a. m., arriving in Klamath Falls at 7:35 p. m., and reaching San Francisco at 9:50 the next morning.



# Railway Age

## Motor Transport Section

*Dedicated to the  
Coordination of Railway and Highway Service*

Vol. 86 April 27, 1929 No. 17  
Name Registered U. S. Patent Office



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# 161 More Gas-electric Buses



Mr. A. T. Warner, General Manager in Charge of Traffic, Public Service Coördinated Transport, Newark, N. J., recently said in an address to the Society of Automotive Engineers at Newark:

"About four years ago experiments were started with a gas-electric-driven vehicle. We now have on our lines approximately 900 of these. The most important factor in favor of the gas-electric motor-coach is the elimination of gear shifting. Short-haul transportation means, with us, an average speed of approximately 10 m.p.h. and that the vehicle will have to stop an average of ten times per mile. Every operator of a mechanical-drive coach, therefore, in the course of 9 hours of work, has to make 3,600 motions of his gearshift lever for passenger stops alone. This figure does not include traffic stops at street intersections or slow-ups at other points where the speed of the vehicle is retarded without stopping to pick up or discharge passengers. Of these motions, 2,700 are made in the process of acceleration. Thus one can realize the great temptation the operators have to start in second or third speed, abuse the clutch and everything behind it, jerk their passengers by improper operation, and damage the equipment in general. In 1925 we estimated that approximately 80 per cent of our road failures, excluding tire trouble, were due to trouble back of the engine, principally in the clutch. This was the point of greatest abuse. The gas-electric drive, which eliminates all gear shifting, has not only greatly reduced this abuse and resulted in an important saving in maintenance, but is also a great boon to the operator and affords a smoother, more comfortable ride for every passenger."



Let the G-E transportation engineers analyze your service and make recommendations for the best type of equipment.

# GENERAL

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y.



# Railway Age

## Motor Transport Section

Devoted to the  
Co-ordination of Railway and Highway Service

Vol. 86

April 27, 1929

No. 17

### One Truck Saves \$28,000 a Year

ELSEWHERE in this issue appears an article describing the manner in which the Jersey Central has been able to realize a saving of approximately \$28,000 a year by the operation of one motor truck in the handling of l.c.l. freight. As will be noted, the inauguration of this trucking operation was preceded by a careful survey of all angles of the situation with particular reference to the train miles actually to be saved and the means of protecting the service in times of peak movement which the truck could not handle. Experience with the smooth working of the plan has since demonstrated the accuracy of the conclusions reached in the surveys. It would seem, therefore, that aside from its utility in the provision of store-door service, there are many situations, similar to that on the Central of New Jersey, where the motor truck may be employed to advantage in economical replacement of trains in line haul service. No independent motor truck operator could make \$28,000 a year by operating one truck. But a railroad can—and has.

### Off-Rail Stations and Ticket Agencies Prove Beneficial

THE railways have one advantage with respect to motor coach operations, which is not enjoyed by independent operators. If they can replace a train costing a dollar or more per mile to operate, with a motor coach having an operating cost of 30 cents per mile or less, they need not be so much concerned as to whether or not the motor coach operation itself shows a net profit. They are the gainers by the reduction in the cost of providing a required service. Moreover, motor coaches can generally be operated at a profit on their own account, if proper methods of traffic development are applied. One way in which traffic can be developed is through the establishment of centrally-located, off-rail motor coach stations, and agencies of various kinds where tickets for transportation in the motor coaches are sold. Most of the railways operating motor coaches have their coaches pick up and discharge passengers at their railroad stations. But most of them also cater to the convenience of their patrons by making other stops at points centrally located with respect to the business centers of the towns which they serve. Similarly, most of the railway motor coach companies have their tickets on sale, not only at the railroad stations, but also in off-rail motor coach stations and in other places, such as drug stores. The uniform experience of the railways operating motor coaches has been that business is increased by the establishment of such centrally located stations and ticket agencies. Unless they are specifically prevented from doing so in

their operating certificates, all the railways will find it worth while to adopt this method of increasing their business.

### 800,000 Miles Without An Accident

THE motor coaches operated by the Santa Fe Transportation Company in the southwest recently passed the 800,000-mile mark with a record completely clear of accidents. Surely this is a record of which any company could well be proud, and one which gives point to the motto of the Santa Fe Transportation Company, "Safety First Under All Circumstances." Five of the Santa Fe drivers have covered 50,000 miles, two of them have covered 100,000 miles, and one has 150,000 miles to his credit, all of course, without accidents. No single department of a motor coach operating company can claim all of the credit for a record of this sort. Safety in operation is a result of managerial ability in the selection and training of drivers, and in the establishment of rules governing the manner in which they do their work; carefulness and efficiency on the part of the drivers themselves; and the thoroughness with which the mechanical department maintains the equipment. Many accidents involving motor coaches are caused by careless drivers of other vehicles, and this is particularly true in localities where there is a dense highway traffic. The Santa Fe Transportation Company is fortunate in not having to work under such conditions. On the other hand, its motor coaches cover routes of such a character that, in many places, even a momentary lapse in the care exercised by the driver might result in disaster. The entire personnel of the Santa Fe Transportation Company deserve great credit for the splendid record of completely safe operation which has been made.

### Motor Truck Competition Becoming More Serious

DRASTIC declines in passenger revenues of the railroads during the post-war years have focused attention on the inroads which have been made by highway competitors into this class of traffic. The freight business, however, buoyed up by the country's prosperity, has not manifested any such reactionary tendency, although its annual rate of growth is much less than in pre-war times. This latter, being a less spectacular manifestation of the competitive situation, has, perhaps, not precipitated the same concern among railway officers as have the passenger losses. It should be realized, nevertheless, that the situation with reference to highway competition for freight traffic threatens to become more serious than has been this

competition for passenger business. This is evident from figures presented at the recent meeting of the Motor Transport Division. These figures were gleaned from a survey made by a southern railroad and, while they refer only to the cotton and strawberry movements from stations on this particular road, they are, none the less, enlightening in their revelation of the tendency of traffic to be diverted from the rails to the highway.

The survey with reference to the cotton movement, covered stations in six southern states and compared the cotton moved out of this territory by motor truck from August 1 to October 15, 1927, with the 1928 movement during the corresponding period. In only one instance did the traffic of the motor trucks decrease. This was in the case of Virginia from which in the 1927 period 1,450 bales, or 44.7 per cent, of the total cotton movement from that state went over the highway, whereas in the 1928 period 946 bales, or 32.1 per cent were moved by truck. From North Carolina, motor trucks in the 1928 period moved 33,368 bales, or 52 per cent, of the total cotton traffic as compared with a 1927 movement of 31.6 per cent, or 29,392 bales. In South Carolina the proportion moved by truck rose from 9.2 per cent of the total in the selected 1927 period to 19.4 per cent in 1928; in Georgia from 1.3 per cent to 2.5 per cent; in Alabama from 0.7 per cent to 2.5 per cent and in Florida from 1.6 per cent to 8 per cent. The total truck movement during the periods under review was small from these latter three states but the increasing tendency is none the less present.

The survey found, in addition to the foregoing, that of 69,231 bales of cotton shipped from one southern port from September 1 to December 31, 1927, the motor trucks hauled 16,260 bales, or 23.5 per cent, while the remaining 52,971 bales, or 76.5 per cent, came into the port by rail. In the corresponding period of 1928, however, the motor trucks hauled 56.8 per cent of this traffic, or 43,998 bales, whereas only 33,475 bales, or 43.2 per cent moved by rail.

The figures on the strawberry movement are equally striking. During 1927 the total movement of this commodity from eastern North Carolina was 574,107 crates. Of this number 20,842 crates, or the equivalent of 92.8 carloads, were shipped by motor truck to such destinations as Norfolk, Richmond, Washington, Baltimore, Philadelphia and New York. In 1928 the total movement was 603,638 crates, of which 57,442, or the equivalent of 251.4 carloads, moved by motor truck to the same destinations.

Furthermore on their visit to the National Stock Yards, while in St. Louis, the delegates to the Motor Transport Division meeting were informed that the equivalent of 11,214 carloads of live stock were trucked into these yards during the years 1927 and 1928 from territory within a radius of 150 miles. Still another revelation came in the announcement that approximately 300,000 bales of cotton were trucked into the Texas ports of Corpus Christi, Houston and Galveston during 1928.

It would seem, therefore, that in view of these manifestations of the inroads which motor trucks are making on railway freight revenues, the remarks of a delegate at the St. Louis meeting were most timely when he stated it to be his belief that this competitive situation "is a very serious proposition, that it is only in its small beginnings, and that the loss sustained because of motor coaches is nothing compared to the loss we will sustain because of trucks if we do not do something about it . . . the figures given out here this morning indicate what is going to happen."

## Railroad Attitude Towards Motor Coaches Has Changed

THE last twelve months have seen a truly remarkable change in the attitude of the steam railways toward the motor coach. There were signs that this change was in process of development earlier than a year ago, but its full effect has been manifested only recently. In view of its far-reaching extent, this change in the railroad attitude may be looked upon with good reason as having some of the aspects of an industrial revolution.

Considered at first as an interloper in the field of passenger transportation, the motor coach has at last won for itself the regard of many railways, the number of which is rapidly increasing, as an agency of prime importance in the rendering of good, economical, efficient passenger transportation service.

A few railways were operating motor coaches as early as 1924 and 1925. One by one, during the next two years, other roads were added to the list of those providing passenger service for their patrons on the highways. But, with a few exceptions, those railways were merely experimenting with the motor coach. In the opinion of many of them it had not, at that time, fully proved its ability to be of use to the steam roads. The railways have been accused, from time to time, of too great inertia with respect to the adoption of new and "better" methods of carrying on their transportation work. The fact of the matter is so many panaceas for all their ills are submitted to the railways (many of them proving under test to be without value) that they have become accustomed to demanding proof of all claims made in behalf of new devices of all kinds. The railways demanded this proof of the motor coach.

That the motor coach is an efficient transportation medium, and a worth-while servant of the railways, has been so thoroughly established as to effect a change in the attitude of most railways toward it. The importance of this change is to be seen in current developments and in the developments of the last few months.

No longer experimentally, but instead with confidence that the motor coach can do for the railways the things claimed for it, many railways, including several rather new to the field, are engaging in motor coach operations on a system-wide basis. Within a few months' time, the Missouri Pacific has established 4,000 or more miles of motor coach lines. Within approximately the same period, the Cotton Belt, with a rail mileage of 1700, has established 1200 miles of motor coach lines. The Pennsylvania has gone far in the same direction, just how far it has not yet announced. So it has been with many other railways.

It is fortunate that this change in the attitude of the railways has taken place. The experience of many roads has proved conclusively that the motor coach has much to offer the railways. It can save them literally millions of dollars annually by taking the place of trains costing four or five times as much to operate; and properly managed, it can make money for the railways over and above the savings resulting from reduced operating expenses. The railways are the backbone of the transportation system of this country. It is the consensus of authorities that this country will enjoy the best possible transportation service when all the railways cease to consider themselves merely as railway companies, but instead as transportation companies, ready and willing at all times to provide the kind of transportation service demanded in the interests of efficiency, economy and convenience to patrons.



# One Motor Truck Saves \$28,000 for Jersey Central

*Careful study of local l.c.l. handling problem finds solution  
in truck substitution—Saves 80 train miles per day*

By J. W. Meredith  
General Superintendent  
Central of New Jersey



Operation of This Truck Has Saved Central of New Jersey Approximately \$28,000 Yearly.

On May 16, 1928, the Central Railroad of New Jersey placed in service one Mack five-ton truck for handling l. c. l. freight at local stations between Red Bank, N. J., and Point Pleasant with incidental trips when and as required to Hazlett, N. J., and Middletown, a total rail distance of 28½ miles. Later a similar service was added for Shrewsbury, N. J. and Eatontown. This operation is believed to be the first motor truck in actual line service to be owned and operated directly by a railroad, co-ordinated with a freight train schedule and under the direct control of the operating department of the railroad.

Direct cars are made from heavy initial loading points to Red Bank, Long Branch and Asbury Park. The truck starts with a load from Red Bank, picks up a second load at Long Branch and a third at Asbury Park, distributing the loads at the nine intermediate stations throughout its route; returning it picks up outbound traffic in reverse order.

It was also arranged that in cases where the initial station had a load of 4,000 lb. or over for a single station, a straight car be made in order to avoid overloading the truck and delaying traffic.

## Reduced Train Mileage Saves \$117 a Day

As a result of this truck service a round-trip way freight steam train was taken off between Jersey City and Point Pleasant. A short-run, pick-up-and-drop run, was substituted between Elizabethport, N. J. and

Matawan making a net reduction in train service of 80 miles per day.

Prior to the truck service being established, the way freights consumed approximately 11.4 hours per day, 3.4 of which was at overtime rate. Allowing for the expense for the short run substituted, there is a net saving of \$116.68 per day in train service.

The average cost for truck operation per day, including depreciation, insurance, supervision and other operating and maintenance costs, amounts to \$25.88, showing a net saving per annum based on 306 working days, of \$27,784.80.

The average motor truck miles run per day is 59.

## Method of Determining Medium Station Tonnages

The Jersey Central had been confronted with the problem of excessive costs in handling its l. c. l. traffic in this particular territory where seasonable fluctuations are wide. There was not sufficient l. c. l. to warrant the operation of an exclusive l. c. l. train and the way freight, therefore, had to be filled out with carload traffic. This made the operation, of stopping at the minor stations to load and unload l. c. l. freight, cumbersome and in like proportion expensive, resulting in excessive overtime by train crews.

It was considered desirable to pay this overtime rather than to run additional trains at still higher expense. The passenger train movement is heavy throughout the year and especially so during the sum-

mer. Any additional trains add to the congestion and should be avoided wherever possible.

The possible economies resulting from the application of motor trucks to any haulage problem can be determined only by careful analysis of accurate load figures of each loading or unloading point for each day over a considerable period of time. In reaching the conclusion that determined the set up for the route an analysis was made of such figures.

The inauguration of the truck service was a result of an exhaustive study made jointly by officers representing the operating department and transportation men of the International Motor Truck Company.

Each freight station between the two points mentioned supplied daily l. c. l. tonnage figures, in and out, for a period of three months. These reports showed wide fluctuations in daily tonnage because of the seasonal variations in the population of the seashore communities. Therefore, averages could not be used as a bases for determining the amount of equipment required, or the time which might be consumed in loading or unloading at a station. It was necessary to apply methods of statistical analysis to the report of each station to find the so-called median tonnage; that is, the daily volume which occurred with the greatest frequency at each station. The median determined was then compared with the highest daily figures shown for each station to discover the frequency with which tonnages occurred above the median.

#### Estimating Truck Operating Costs

The committee that made the preliminary survey of the proposed route found that many factors entered into the problem of estimating the operating cost of automotive equipment. These costs consist of the summation of the number of individual items of expense. These items are subject to great variation, according to the conditions of service, the design of the truck or trailer, the nature of the body or container, the quality of the maintenance accorded to the equipment, the skill of the operator, the locality in which the equipment is operated, traffic, pavement and grade conditions, and the actual amount of work to be performed.

The various items of expense are not affected alike by the differences in operating conditions, nor does the cost of operating under the same conditions vary proportionately with the mileage or the amount of work to be done. For this reason average costs mean but little, and it is useless to expect that the result of inquiries made of other operators will apply.

So-called normal costs, even when honestly compiled by the most earnest operators, are useless to owners or prospective operators who do not know how near or how far above or below this arbitrary case their own costs may be. Consequently, the only safe way of predicting what operating costs may reasonably be expected from any given installation is by means of an intelligent estimate based on the actual conditions which surround it. Such an estimate can apply to the particular installation for which it was made, being based on the principal operating conditions, with values placed on each factor in its proper degree as determined by the conditions. The operating costs, divide themselves into three distinct groups; fixed charges, maintenance charges and running charges.

Fixed charges include amortization of investment, interest of investment, insurance and license fees. The investment must be amortized in the life of the vehicle to provide for its replacement. In the case of operations having a considerable annual mileage, amortization is figured on the basis of the mileage life of the

vehicle. In the route under consideration, as the annual mileage is low, amortization is figured on the basis of a life of 10 years in order to arrive at a conservative figure and in making a comparison with the estimates furnished by others, this conservative and relatively high figure was taken into account.

The cost of carrying the investment is covered by the interest on the investment. It was assumed by the committee that an account would be set up to cover amortization, and as the average amount of that account during the term of 10 years would be one-half of the investment, interest was figured on but one-half instead of the total amount of the investment.

The insurance figures included represented the cost of all forms of coverage essential to proper protection, with limits adequate for the operating conditions. The state license fees were included in this item, but it was assumed that no other taxes would be imposed.

Maintenance charges include: (1) garaging; (2) labor for washing, lubricating, adjusting, etc.; (3) chassis and body repairs; (4) chassis and body overhaul; (5) repainting; (6) miscellaneous garage supplies and materials; and (7) substitute trucks.

1.—Garaging includes the items of storage, light and heat. If the equipment is garaged in a building owned by the Company, a charge should be made to cover investment in the property.

2.—General care and upkeep are covered by this item, which is greatly influenced by the quality of inspection. Efficiency in this regard results in economical operation.

3.—Chassis and body repairs include the items of repair which are found necessary from time to time while the vehicle is in service. Proper inspection will reduce this item, whereas casual inspection will cause it to mount because of worn parts, lack of lubrication, breakdowns from loose bolts and improper adjustment.

4. 5. 6.—The cost of overhauling is an item which is affected by the quality of garaging and inspection, inasmuch as delay in making repairs, due to inadequate inspection of proper shop facilities, result in much greater cost of maintenance than would otherwise be necessary. This charge is not normally necessary on trailers. Equipment should be repainted often enough to preserve its good appearance and also to prolong its life. Under normal conditions, repainting once a year is sufficient. A number of sundry supplies, such as grease, gear compound, alcohol, kerosene, waste and rags, are covered by this item.

7.—To replace any vehicle when out of service for adjustment, repairs, overhauling or repainting, spare equipment must be maintained or rented. The cost included for spare equipment is sufficient to cover either arrangement.

Running charges include wages of the operator, gasoline, oil and tires. The operators' wages should be adequate for the employment of good, careful men for this work. Economy in gasoline can be obtained by proper engine inspection and adjustment. Good supervision will keep down the cost of running supplies.

The consumption of oil is dependent on the condition of the piston and rings and a careful check should be kept on this item.

Tires must be replaced, and the charge is the cost per set divided by the estimated mileage life. They should be depreciated in two years, owing to the small mileage run over this particular route.

Inasmuch as the operating costs are made up of certain charges which are fixed on a time basis, and other charges which are fixed on a mileage basis, it is apparent that the cost per mile will vary with the mileage



for a given period. The items fixed on a time basis are, therefore, distributed in proportion to the mileage and, if a change is made in the mileage as estimated, these operating cost figures may be readily revised by distributing such items according to actual mileage.

No executive, clerical or other overhead expenses are included. The salaries of those having supervision over the truck operations and the wages paid for clerical hire are not known, but it is believed that 20 per cent of the operating costs should be sufficient to cover these items of expense.

## B. & O. Acquires Two Independent Coach Lines

THE West Virginia Transportation Company, motor coach operating subsidiary of the Baltimore & Ohio, has recently extended its highway routes in West Virginia by the acquisition of two independent highway lines. They are the Reynolds Bus Line Company which operates between Clarksburg and Cairo and the Reynolds Taxi Company, operating between Clarksburg and Weston.

The former line closes the gap in the B. & O. highway service between Grafton and Parkersburg and permits through motor coach runs between these points. Former B. & O. operations on this route were between Grafton and Clarksburg and between Parkersburg and Cairo.

In addition, permission has been secured to establish a branch line operation from Ellenboro, a point on the motor coach route to St. Mary's, a point on the Ohio River division of the Baltimore & Ohio. This latter provides a short route from the Parkersburg branch to the Ohio River division since it eliminates the necessity of going through Parkersburg.

Motor coach service was, on April 4, substituted for train service between Flatwoods, Sutton and Gassaway. The complete operation of the West Virginia Transportation Company now provides service between Fairmont and Grafton, Grafton and Parkersburg, Clarksburg and Weston, Weston and Buckhannon, Grafton and Rosemont, Flatwoods and Gassaway and St. Mary's and Ellenboro. In addition to the franchises and other rights involved in the purchase of the independents, the B. & O. secured 12 Studebaker motor coaches. A garage where the highway subsidiary does the major portion of its own repair work has been established at Clarksburg in the vicinity of which there are 25 of its motor coaches in operation.

A previous article outlining original routes and schedules of the West Virginia Transportation Company appeared in the *Motor Transport Section* of February 23.

## Hycoe Automotive Fan Belts

FAN belts in both flat and vee-types have recently been placed on the market by the Manhattan Rubber Manufacturing Company, Passaic, N. J. The flat type belt consists of a plied-up center of special cord fabric with a red cover of tight-woven fabric. The vee-type belt is made with a cord center, which is cushioned with soft-rubber stock and finished with a red cover of tight-woven fabric. It is claimed that both belts are impervious to temperatures and moisture and will not stretch, shrink, or slip.

## Railroads Report on Their Motor Transport Activities

THE annual reports to the stockholders for 1928 of a number of railroads which have highway subsidiaries have been published. A number of these railroads make pertinent comments on their motor transport operations and such comments from reports of several of these railroads follow:

### P. R. R. Plans Progressive Expansion of Highway Service

For several years your management has made intensive studies and experiments in connection with the development of motor transportation, and where the public demonstrated its desire to use trucks and buses, and private motor cars, and discontinued the use of trains and stations, efforts had to be made to adjust the rail service accordingly. In many cases train service had to be substantially reduced and short branch lines abandoned, because the rail revenues were so much below the costs of operation.

Your company is co-operating with various companies specializing in motor traffic, and plans have been worked out for the co-ordination of rail and bus service in a large part of the territory served by your lines. This service will be established progressively, both to meet public needs as they arise and to encourage the continued development of your Company's traffic, and there has been incorporated in the interest of your Company the Pennsylvania General Transit Company.

### Southern Pacific's Motor Transport Operations Actively Extended

In last year's report, mention was made of the incorporation in April, 1927, of the Southern Pacific Motor Transport Company, all of whose capital stock is owned by your company. During the year 1928 the operations of the Southern Pacific Motor Transport Company have been actively extended, with the view of providing a more economical method of transportation by the substitution of motor coaches for steam and electric trains, and of providing supplementary feeder service for your Company's lines, where profitable. The substitution of motor coach service for steam train operation is being established where it is found more economical, upon securing the approval of the necessary regulatory commissions. Such substitutions have been made upon several branch lines in California; and motor bus operations in Oregon have enabled your company to discontinue to a great extent both electric and steam train operations on branch lines which were no longer profitable. Interstate operations have been established between Los Angeles, California, and El Paso, Texas; between San Francisco, California, and Portland Oregon; between Grants Pass, Oregon, and Eureka, California; between Truckee, California, and Reno, Nevada; and between Phoenix, Arizona, and Lordsburg, New Mexico, over the Apache Trail.

To provide a more flexible service and to secure greater economy in operation, the Southern Pacific Motor Transport Company, during 1928, acquired control, by stock ownership, of the Oregon Stages, Inc., and the Coast Auto Lines, Inc., and similarly in January, 1929, acquired control of the Pacific Stages, Inc. These three companies operate a total of 75 motor coaches in intrastate service in Oregon, and these operations, together with the operations of the Southern Pacific Motor Transport Company, will provide an adequate and co-ordinated service with your company's rail lines serving Western Oregon resulting in improved service and reduced expenses. With the acquisition of these three companies, the Southern Pacific Motor Transport Company now has a total of 222 motor coaches, trucks and service cars operating in the States of Oregon, California, Nevada, Arizona, New Mexico and Texas.

The Pacific Electric Railway Company, a wholly-owned subsidiary of the Southern Pacific Company, operating 686.56 miles of electric lines in Southern California, is located in one of the most rapidly growing territories of the United States, and while the increase in population in that part of California has been marked, the passenger business of the Pacific Electric Railway Company has not grown in proportion, both the inter-urban lines and the local street car lines of that Company having been seriously affected by the increasing motor coach and automobile competition. To meet this condition the Pacific Electric Railway Company established a motor coach service,

and is now operating forty-two motor coaches over ten inter-urban routes, aggregating 143 miles, and seventy-two motor coaches over sixteen routes, giving city service, aggregating 81 miles, or a total of one hundred and fourteen motor coaches operating over twenty-six routes having an aggregate length of 224 miles.

The Western section of Los Angeles is served locally by the Pacific Electric Railway Company and by the Los Angeles Railway, and in order to meet parallel motor coach competition which was threatened, a joint agency, known as the Los Angeles Motor Coach Company, was formed by the Pacific Electric Railway and the Los Angeles Railway. This joint agency, with 132 motor coaches, is now operating, for the equal joint account of the parent companies, four routes giving cross-town service between the territory served by the Pacific Electric and that served by the Los Angeles Railway, and two routes from the center of the City through territory served by both lines.

In Southern California, motor truck operation has diverted from the railroads a large amount of the local less-than-carload business and to meet this competition, there was incorporated on October 13, 1928, the Pacific Electric Motor Transport Company, all of whose capital stock is owned by the Pacific Electric Railway Company. This company will begin operations in the Spring of 1929 with an experimental service from store door to store door, the pick-up and delivery service being rendered, as far as possible, by local motor truck companies, under contract and lease arrangements, the railway being used for the line haul service.

#### New Haven's Subsidiary Does Increasing Business

The motor coach lines operated by the New England Transportation Company show an increase in net income over the previous year, due largely to a continued growth in traffic. During the year eleven new lines were added and seven lines (one operated jointly) discontinued, which makes a total of fifty-eight lines operated, including five operated jointly.

##### New England Transportation Company Combined Income Account

	Year 1928	Comparison with 1927 Increase
Operating Revenues:		
Passenger .....	\$2,864,819.82	\$835,064.39
Other .....	196,207.08	7,846.39
Total .....	3,061,026.90	842,910.78
Operating Expenses:		
Maintenance of Way and Structures .....	7,082.70	2,401.46
Maintenance of Equipment .....	1,054,873.88	256,547.78
Transportation .....	1,232,407.79	369,432.15
Other .....	336,304.56	51,348.56
Total .....	2,630,668.93	679,729.95
Net Operating Revenue .....	430,357.97	163,180.83
Tax Accruals .....	157,410.57	38,858.69
Operating Income .....	272,947.40	124,322.14
Non-Operating Income .....	9,579.13	* 6,515.62
Gross Income .....	282,526.53	117,806.52
Deductions from Gross Income .....	174,274.74	64,547.27
Net Income .....	\$108,251.79	\$53,259.25

Operating Expenses were 85.94% of Total Operating Revenues, a decrease of 2.01 compared with 1927.

The N. Y., N. H. & H. R. R. Co. owns the entire issue of capital stock and its investment in this Company is as follows:

	Par Value	Book Value
Stock .....	\$1,500,000.00	\$1,500,000.00
Notes .....	913,500.00	913,500.00
Total .....		\$2,413,500.00

\* Decrease.

The Balance Sheet of this company shows total investment of \$4,263,541.36 and total assets of \$4,676,211.60.

#### Both Truck and Motor Coach

##### Operation Increase on B. & M.

The operations of the Boston & Maine Transportation Company show a loss for the year of \$21,478.71, after charging \$89,870.92 for depreciation for equipment. The transportation company's accounts, however, contain no credit for savings to the railroad through the substitution of highway service by the transportation company for that operated by the railroad at a substantial loss. The operation of trucks has also made possible some operating savings on the part of the railroad.

Both bus and truck operations expanded during the year. The co-ordination of trucking operations with rail freight

movement has resulted in many improvements in service to the shippers with consequent increases in tonnage.

The policy with respect to operation of the highways has been to use them wherever possible in the interest of more efficient operation and the improvement of service to travelers and shippers.

#### Reading Motor Coach Service

##### Economical and Satisfactory

On January 27, 1928, a charter was granted by the Governor of Pennsylvania to Reading Transportation Company, which had been formed to conduct a motorcoach service in the several counties through which the lines of the Reading Company are operated. The charter of the company was amended September 27, 1928, so as to permit the transportation of groups and parties between certain points.

The authorized capital of the company is \$1,000,000 of which \$300,000 had been issued and acquired by Reading Company to December 31, 1928.

The motorcoach routes operated by the Reading Transportation Company at the close of the year 1928 were as follows:

Jenkintown to New Hope, Pa. ....	24.4 miles
Reading to Hamburg, Pa. ....	17.0 "
Carlisle to Shippensburg, Pa. ....	22.5 "
Carlisle to Gettysburg, Pa. ....	29.9 "
Pottsville to Lykens, Pa. ....	32.0 "
Pottsville to Shenandoah, Pa. ....	12.0 "
Doylestown to Langhorne, Pa. ....	19.3 "
Doylestown to Lansdale, Pa. ....	12.0 "
Pottstown to Bally, Pa. ....	13.3 "
Milton to West Milton, Pa. ....	1.2 "
Atlantic City to Cape May, N. J., via Ocean City and Wildwood .....	45.2 "
Total .....	228.8 "

The Reading Transportation Company had 32 motorcoaches in operation at the close of 1928. During the year a garage building was constructed at Doylestown for the accommodation of motorcoaches and a similar structure has been authorized at Newtown, Pa. Motorcoach service along the routes has proven economical and satisfactory.

## Union Pacific Extends Motor Coach Operations

UNION PACIFIC STAGES, subsidiary of the Union Pacific System, has extended its operations in the northwest through the purchase of the Blue Mountain Transportation Company, operating between Pendleton, Ore., and Lewiston, Idaho, and the Interstate Coach Company, operating between Spokane, Wash., and Lewiston, via Colfax, Pullman and Moscow. The latter company has lines also from Spokane to Tekoa, Wash., and from Lewiston to Grangeville, Idaho. With the acquisition of the Blue Mountain Transportation Company, the Union Pacific secured five Yellow coaches and complete control of the territory between Pendleton and Lewiston, thus putting it in a position to supplement its present service between these points.

With the purchase of the Interstate Coach Company 12 Yellow coaches and two Garford motor coaches with some additional equipment were secured. The purchase of the latter company also brought controlling interest in the Motor Coach Terminal, Inc., at Spokane, which is the central station out of which all such lines at Spokane operate. With additional equipment the Union Pacific Stages will furnish through service between Portland, Spokane and Lewiston and will improve the local service where necessary. This motor coach operation now covers 725 miles of routes. B. T. Peyton, formerly vice-president and superintendent of the Columbia Gorge Motor Coach System, has been appointed manager of the Union Pacific Stages, with headquarters at Portland. Two division superintendents will work under his supervision and will have headquarters at Portland and Spokane.





One of the Six Model 54 White Motor Coaches Operated by the Cotton Belt.

## Cotton Belt Replaces Trains with Motor Vehicles

*Has 1,126 miles of motor coach lines and 1,243 miles of truck lines—868 daily passenger train miles already eliminated*

CARRYING out a policy of substituting motor vehicles, with their low operating cost, for local trains which have been expensive to operate and have been unsuccessful in retaining the passenger business which they once enjoyed, the St. Louis Southwestern, within the space of a few months, has become one of the leading railway operators of motor vehicles in passenger and freight service. The Cotton Belt system, including the St. Louis Southwestern and the St. Louis Southwestern of Texas, has 1,748 miles of lines. Although it adopted its present policy of substitution of motor vehicles for trains as recently as late last year, it now has a total of 1,126 miles of motor coach lines and 1,243 miles of motor truck lines, all operated by its subsidiary, the Southwestern Transportation Company.

### Location of Routes

Most of the highway routes of the Cotton Belt are located in Arkansas and Texas where its railway lines are concentrated. It does however, have, one line which enters the state of Missouri, and another which extends for a short distance into Louisiana. The northern terminus of the motor coach and truck system is at Malden, Mo., a short distance north of the Missouri-Arkansas state line. From this point, the highway service for both passenger and freight traffic extends to Jonesboro, Ark., a distance of 89 miles. Between Jonesboro and Stuttgart, Ark., the Southwestern Transportation Company holds an operating certificate, but it has been

unable to establish highway service on account of bad road conditions. From Stuttgart, the motor coach and truck lines extend without a break along the main line to Texarkana, Tex. Branch lines in the state of Arkansas extend also from Little Rock to Gillett, 99 miles, from Pine Bluff to England, 27 miles, and from Lewisville to Arkana, La., 27 miles.

In Texas, the Southwestern Transportation Company has both motor coach and truck lines between Texarkana and Mount Pleasant. From the latter point the



Three-Ton White Truck Operated in L. C. L. Freight Service

motor coach and truck lines extend parallel to the main line to Waco, with branch lines to Marshall, Henderson and Nacogdoches, to which only motor coach service is provided, and to Lufkin, to which both motor coach and motor truck service is furnished. Truck service is provided over the entire main line from Mount Pleasant to Fort Worth and Dallas, with motor coach service over portions of the line. The remaining motor coach lines are between Greenville and Denton, Farmersville and Dallas, and Wylie and Fort Worth. Other motor truck lines operate between Sherman and Greenville, and between Hot Springs and Little Rock in Arkansas.

### Replacement of Train Service

Up to the present time, the Cotton Belt has been able to eliminate ten local passenger trains between various points on its Arkansas lines, but no local freight trains having been taken off. A total of 868 daily passenger train miles has been eliminated. The substitution policy is to give at least twice as frequent service by motor coach as was given by the trains taken off.

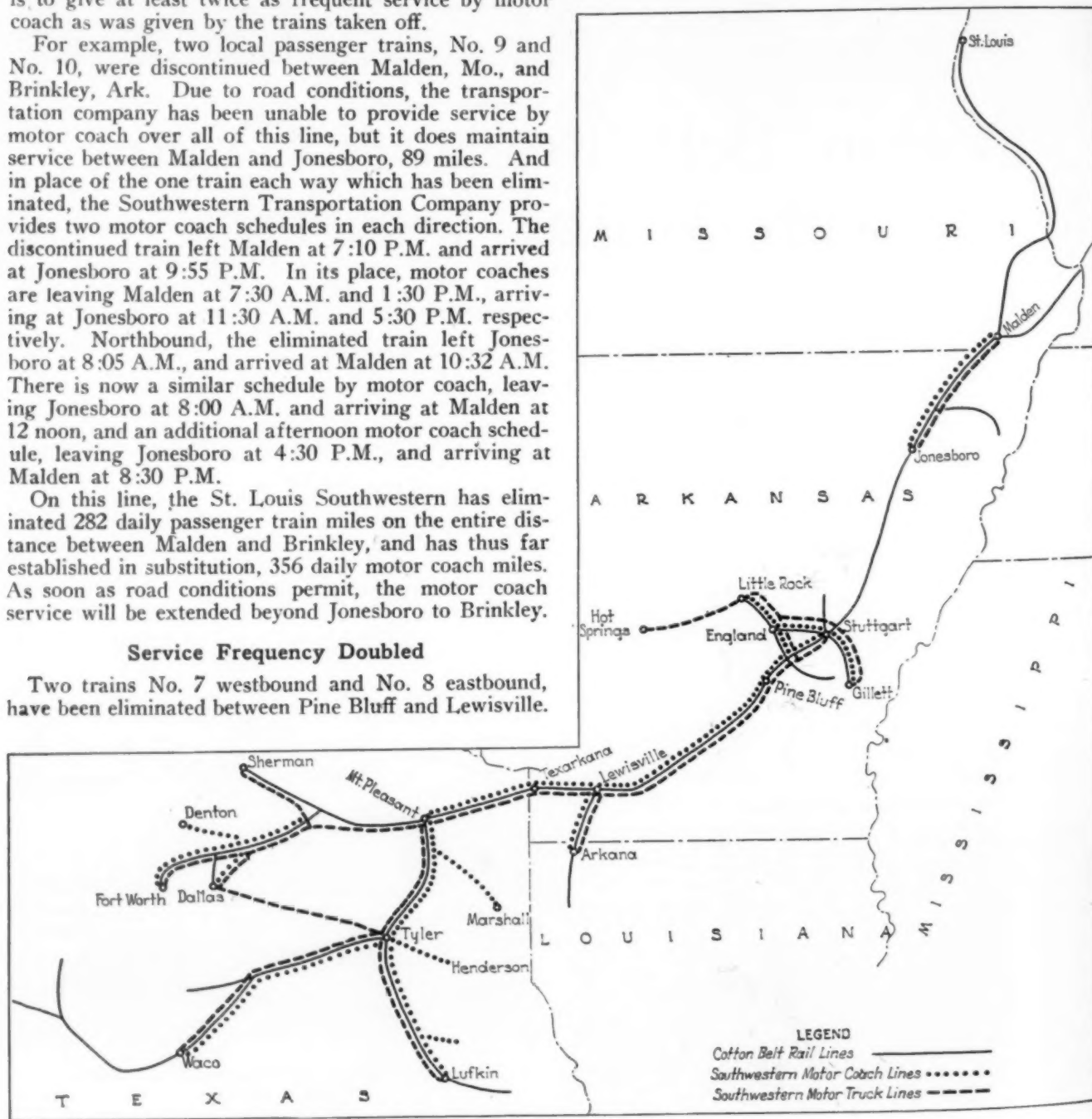
For example, two local passenger trains, No. 9 and No. 10, were discontinued between Malden, Mo., and Brinkley, Ark. Due to road conditions, the transportation company has been unable to provide service by motor coach over all of this line, but it does maintain service between Malden and Jonesboro, 89 miles. And in place of the one train each way which has been eliminated, the Southwestern Transportation Company provides two motor coach schedules in each direction. The discontinued train left Malden at 7:10 P.M. and arrived at Jonesboro at 9:55 P.M. In its place, motor coaches are leaving Malden at 7:30 A.M. and 1:30 P.M., arriving at Jonesboro at 11:30 A.M. and 5:30 P.M. respectively. Northbound, the eliminated train left Jonesboro at 8:05 A.M., and arrived at Malden at 10:32 A.M. There is now a similar schedule by motor coach, leaving Jonesboro at 8:00 A.M. and arriving at Malden at 12 noon, and an additional afternoon motor coach schedule, leaving Jonesboro at 4:30 P.M., and arriving at Malden at 8:30 P.M.

On this line, the St. Louis Southwestern has eliminated 282 daily passenger train miles on the entire distance between Malden and Brinkley, and has thus far established in substitution, 356 daily motor coach miles. As soon as road conditions permit, the motor coach service will be extended beyond Jonesboro to Brinkley.

### Service Frequency Doubled

Two trains No. 7 westbound and No. 8 eastbound, have been eliminated between Pine Bluff and Lewisville.

Train No. 7 left Pine Bluff at 9:12 A.M. and arrived at Lewisville at 1:49 P.M., while train No. 8 left Lewisville at 11:30 A.M., and arrived at Pine Bluff at 4:00 P.M. Under the substitution program, two motor coach schedules have been established in each direction between Pine Bluff and Camden, and three motor coach schedules in each direction daily between Camden and Lewisville, these latter schedules extending beyond Lewisville to Texarkana. In addition to a morning schedule, westbound out of Pine Bluff, the motor coaches provide an afternoon schedule. Similarly, there is an additional early morning schedule, east bound out of Camden for Pine Bluff, as well as a motor coach schedule near that of the train which was replaced. Between Camden and Lewisville, westbound, one motor coach schedule is close to that of the eliminated train, while there are additional schedules in the early morning and late afternoon. A similar increase in the frequency of service has been effected between Lewisville



Cotton Belt Rail, Motor Coach and Motor Truck Lines





The Southwestern Transportation Company Has Purchased 19 Type W Yellow Coaches

and Camden, eastbound. A total of 242 daily passenger train miles has been eliminated on this section. The daily motor coach mileage between Pine Bluff and Lewisville is 682.

Four trains, No. 437, No. 438, No. 407-7-807, and No. 408-8-808, have been eliminated between North Little Rock and Pine Bluff, these representing the entire local passenger train service between these points. In their place, eight motor coach schedules have been established between Little Rock and England, and six motor coach schedules between England and Pine Bluff. The trains formerly left North Little Rock at 7:00 A.M. and 3:20 P.M. The motor coaches now leave Little Rock at 7:00 A.M., 3:05 P.M., and 6:30 P.M.

The eliminated trains formerly left Pine Bluff at 7:45 A.M. and 4:00 P.M. The motor coaches now leave Pine Bluff at 7:00 A.M., 11:00 A.M., and 6:15 P.M., and there is an additional schedule beyond England. The daily passenger train miles eliminated between Little Rock and Pine Bluff aggregate 220. The present daily motor coach mileage between these points is 389.

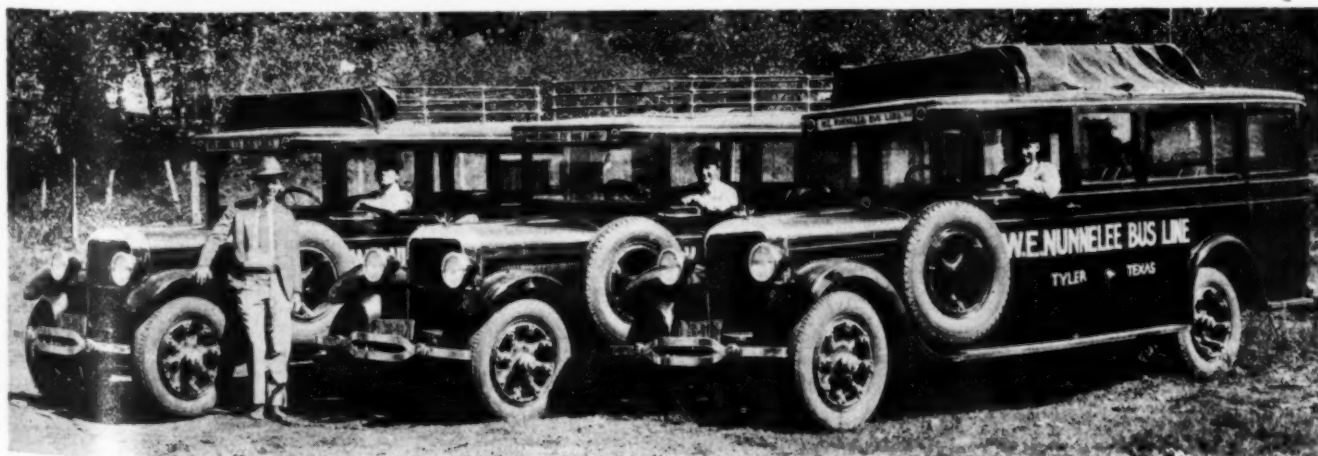
Two trains have been taken off between England and

Gillett, one in each direction daily. The patrons on this route now have the benefit of four motor coach schedules in each direction daily between England and Stuttgart, and two motor coach schedules in each direction daily beyond Stuttgart to Gillett, and an additional Stuttgart-De Witt schedule. In taking off the two trains, the Cotton Belt saves 124 daily passenger train miles. Its motor coach mileage between England and Gillett is 421 daily.

It will readily be seen that in every instance the substitution of motor coach service for passenger train service has been carried out with the intention, not only of replacing expensive train service with less expensive motor coach service, but also of improving substantially the service rendered to the patrons. Tickets of the St. Louis Southwestern or foreign lines tickets reading via St. Louis Southwestern railway lines are honored on the motor coaches. This does not apply, however, to reduced fare tickets issued by the railway line.

#### Organization of Transportation Company

Daniel Upthegrove, president of the St. Louis Southwestern, is president also of the Southwestern Trans-



Three Studebaker Coaches Taken Over with the Purchase of the Nunnelee Lines in Texas

portation Company. The operations of the latter organization are under the direct supervision of D. W. Russell, vice-president and general manager. B. G. Austin is assistant to the vice-president and general manager. H. P. Moore, Jr., is traffic manager, and Warren A. Taussig is general superintendent. All of these officers have their headquarters at Little Rock.

The operations are in the direct charge of two division superintendents, one with jurisdiction over the Arkansas and Missouri division, and whose headquarters are at Little Rock, and the other with jurisdiction over the Texas division, with headquarters at Tyler. Maintenance work is in charge of a superintendent of main-

The trucks used in handling freight have either closed or stake bodies and do not adhere so closely to definite schedules, their times of departure depending largely upon the times when loads are received.

In addition to the common carrier equipment mentioned above, the company has five official cars of various types, used by the officers of the company and by the traveling inspectors. It secures its motor coach tires on a mileage basis, but owns its motor truck tires.

The company maintains running repair shops at Jonesboro, Pine Bluff, Stuttgart, North Little Rock, Greenville, Tyler, and Texarkana. Texarkana is also the headquarters for general overhaul and rebuilding

### Cotton Belt Motor Coach and Truck Lines

Motor Coach Lines		Motor Truck Lines		Passenger Trains Eliminated	
Between	Mileage	Between	Mileage	Between	Daily Train Miles
Jonesboro-Malden	89	Jonesboro-Malden	89	Malden-Brinkley	282
Little Rock-Gillett	99	Little Rock-Gillett	99	Pine Bluff-Lewisville	242
Stuttgart-Pine Bluff	42	Stuttgart-Pine Bluff	42	No. Little Rock-Pine Bluff	220
Pine Bluff-England	27	Pine Bluff-England	27	England-Gillett	124
Pine Bluff-Texarkana	180	Pine Bluff-Texarkana	180	Total	868
Lewisville-Arkana	27	Lewisville-Arkana	27		
Texarkana-Tyler	146	Tyler-Lufkin	92		
Tyler-Lufkin	92	Tyler-Waco	143		
Tyler-Henderson	44	Wylie-Fort Worth	55		
Tyler-Waco	143	Hot Springs-Little Rock	58		
Gladewater-Marshall	36	Texarkana-Dallas	209		
Greenville-Denton	71	Sherman-Greenville	46		
Farmersville-Dallas	47	Tyler-Mt. Pleasant	74		
Alto-Nacogdoches	28	Tyler-Dallas	102		
Wylie-Fort Worth	55	Total	1243		
Total	1126				

tenance and an assistant superintendent of maintenance, assisted by two traveling mechanical inspectors. Under the traffic manager are two assistant traffic managers, one on the Arkansas and Missouri division, and the other on the Texas division, as well as a number of freight agents and solicitors.

With respect to the passenger service, the motor coaches of the Southwestern Transportation Company are carefully co-ordinated with the passenger trains of the railway. Tickets are sold by the railway agents at some of the points served by the motor coaches, and the motor coaches stop at the passenger stations as well as at other points in the towns along the line. The freight service, however, is carried on more or less in competition with the railway freight service. This accounts for the employment of a number of freight agents and solicitors. The transportation company employs commission ticket agents selling tickets for transportation in its motor coaches, in some of the larger towns. The company issues its own tariffs covering the freight services, and provides store door and pick-up and delivery service at all points.

### Equipment

Since the beginning of its operations, the Southwestern Transportation Company has purchased 37 new motor coaches and 34 new motor trucks. The motor coaches ordered included: 8 Model 54 Whites, 5 Model 53 Whites, 19 Type W Yellow Coaches, 2 Model 76 Studebakers, and 3 Buick Flexibles. The new motor trucks purchased included: 10 Model 54HS International Harvesters, 6 Model 51-A Whites, 6 Model 58 Whites, 5 Model T-60-C G.M.C.'s, 2 Model T-42 G.M.C.'s, 2 Reos, 2 Model AK Macks, and 1 Model AB Mack. Including the equipment taken over from the various independent lines which the Southwestern Transportation Company purchased, it now has in operation 70 motor coaches, 38 motor trucks and 2 trailers.

The motor trucks handle express and mail as well as freight. All the trucks used in the express and mail service have closed bodies and are operated on schedule.

work. Additional running repair shops will be established later at Camden, Waco, Lufkin and Dallas. The maintenance policy is to provide running repair shops at the terminals and at the ends of individual runs, where no major repair work will be done, but certain minor adjustments can be made and the equipment can be cleaned. In the rebuilding shop at Texarkana, all equipment will be given periodically a complete overhaul and rebuilding where necessary.

\* \* \*



Wide World  
Exterior and Interior Views of Long Distance Motor Coach in Service in Germany



## Burlington Starts Its First Motor Coach Lines

THE Burlington Transportation Company, subsidiary of the Chicago, Burlington & Quincy, is now operating its first motor coach lines, parallel to the railway lines, between several of the principal cities of Nebraska. At the outset, only a skeleton service is being provided, but this is expected to be augmented greatly in the near future when the organization of the transportation company will have been completed.

At the present time, the Burlington Transportation Company has five motor coaches in Nebraska, three of these is regular daily service, and two in reserve. Having been granted permission by the Nebraska State Railway Commission, the Burlington is using these on three routes, one between Lincoln, Neb. and Omaha, and the other two between Lincoln and Hastings. Two round trips per day are being operated over the 67-mile route between Omaha and Lincoln, the operation aggregating 268 motor coach miles per day. One motor coach leaves Lincoln at 8:30 A.M., arrives at Ashland at 9:23 A.M., and reaches Omaha at 11:00 A.M. Returning, it leaves Omaha at 12:30 P.M., arrives at Ashland at 1:47 P.M., and arrives at Lincoln at 3:00 P.M. The other schedule provides for departure from Lincoln at 3:15 P.M., arrival at Ashland at 4:28 P.M., and at Omaha at 5:45 P.M. Returning, the schedule calls for departure from Omaha at 7:00 P.M., arrival at Ashland at 8:17 P.M., and arrival at Lincoln at 9:25 P.M.

With the skeleton service now in effect, two routes are covered between Hastings and Lincoln, one via Grand Island and the other via Fairmount. Leaving Hastings at 5:20 A.M., the coach arrives at Grand Island at 6:25 A.M., and after stopping at Aurora, York and Seward, reaches Lincoln at 10:20 A.M. This route is over highways Nos. 11, 5 and 38, and the distance is 129 miles. Returning, the coach leaves Lincoln at 4:00 P.M., arrives at Fairmount at 6:15 P.M., and reaches Hastings at 8:00 P.M., with regular intermediate stops at Crete, Sutton and Harvard. This route covers highways Nos. 77, 15 and 28 and the distance is 111 miles. On this route, the transportation company is operating 240 motor coach miles per day, giving it a total of 508 per day on its Nebraska operation as it now exists.

### Officers of the Company

T. J. Thomas, assistant to the president of the Chicago, Burlington & Quincy, has been appointed also president of the Burlington Transportation Company. H. W. Johnson, controller of the railway, has been appointed also vice-president of the transportation company. F. D. Hite has been made general manager of the motor coach operating subsidiary. The president and vice-president will have their headquarters in Chicago, but it has not yet been decided where the headquarters of the general manager will be located.

The transportation company was organized in February of this year, and it was stated at that time that the company expected to be operating from 3,000 to 5,000 motor coach miles per day, in various parts of the 12 states through which the Burlington operates, before the middle of the summer. The company has applications pending before the Illinois Commerce Commission and the Missouri Public Service Commission for permission to operate motor coaches over highways parallel to the main line between Galesburg, Ill., and St. Joseph, Mo.

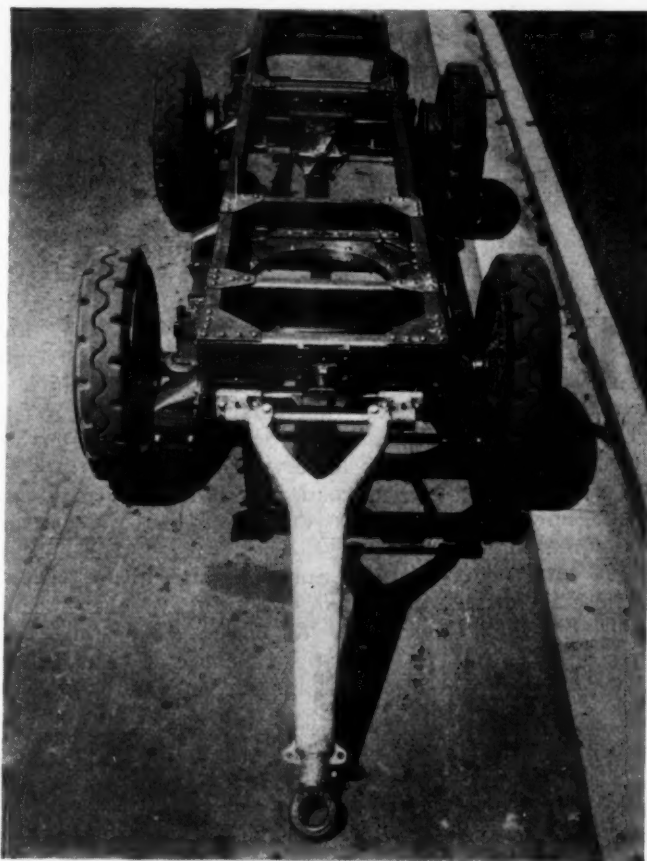
## Mack Builds Truck Trailers

MACK Trucks, Inc., New York, announces that it is prepared to furnish four-wheel trailers to those operators desiring to augment the carrying capacity of their truck units. These trailers are completely Mack built and incorporate many of the features of the Mack trucks.

### Five- or Ten-Ton Trailers

The trailers are available in either five- or ten-ton capacities, the design in both cases being similar, except in the ten-ton model, larger parts and heavier construction are necessary. Trailers may be furnished either with pneumatic-tired disc wheels or optional tires on steel wheels.

The side rails and cross members of both models are of pressed steel. The frame is hot-riveted to give a



Construction of the Mack Four-Wheel Trailer

clean, rugged construction. Standard truck axles of drop-forged steel and I-beam section are used. The draw bar is a steel casting with a forged steel eye, which fits the standard type of pintle hook.

Brake drums 18 in. in diameter are located at the ends of the front axle and are actuated through a vacuum booster. Standard connections for the booster are furnished to match the truck connections.

The design of the fifth wheel or steering mechanism is of the ring type with machined bearing surfaces. With the Mack fifth wheel, the trailer follows the truck without snaking or whipping.

An additional feature of these units is the use of Mack rubber shock insulators at all spring ends, to reduce vibration to a minimum and eliminate the necessity for spring-shackle lubrication.

# L.C.L. Transfer

*Cincinnati Motor Terminal  
in that city where  
by trap car  
dis*



*Loading Containers at a Sub-station*

**T**HE Cincinnati Motor Terminals Company, during 1928, handled 251,302 tons of l.c.l. freight in its motor truck interchange service which is employed by the seven railroads entering Cincinnati. The service is at present confined to railway stations interchanges and thus is a service in lieu of trap car services among the railroads. Pending railroad consent, however, it has not yet been extended to industries making trap cars.

A total of 25 stations and sub-stations are served. These are located on the lines of the Baltimore & Ohio; Chesapeake & Ohio; Cleveland, Cincinnati, Chicago & St. Louis; Louisville & Nashville; Norfolk & Western; Pennsylvania; and Southern.

In the performance of these interchange services, The Cincinnati Motor Terminals Company employs 21 five-ton motor trucks, 250 demountable truck bodies, 66 electric cranes and 13 sets of hand hoists.

## Containers Are Truck Bodies

As may be seen from the accompanying illustrations, the truck bodies are enclosed freight containers with end and side doors for loading and unloading. They are 17½ ft. long, 8 ft. wide and 7½ ft. high. The electric cranes are installed at the larger freight volume stations while at the smaller points the hand hoists have been found adequate to the needs of the service. Physical conditions and space limitations necessitated slight structural variations in the installations of these handling facilities at the different stations. These variations however do not require different handling methods, for in all cases cleaves on the ends of the cable engage with hooks fastened to the top sides of the containers and the container is raised and lowered while in a level position. The container is either lowered from the truck to the floor or platform of the freight house or is suspended on horses from the freight house platform at floor level. Thus there is no vertical lift required in loading nor flooring in unloading, since freight is handled on hand trucks directly from container to car or vice versa.

In moving the  
251,302 tons  
which it

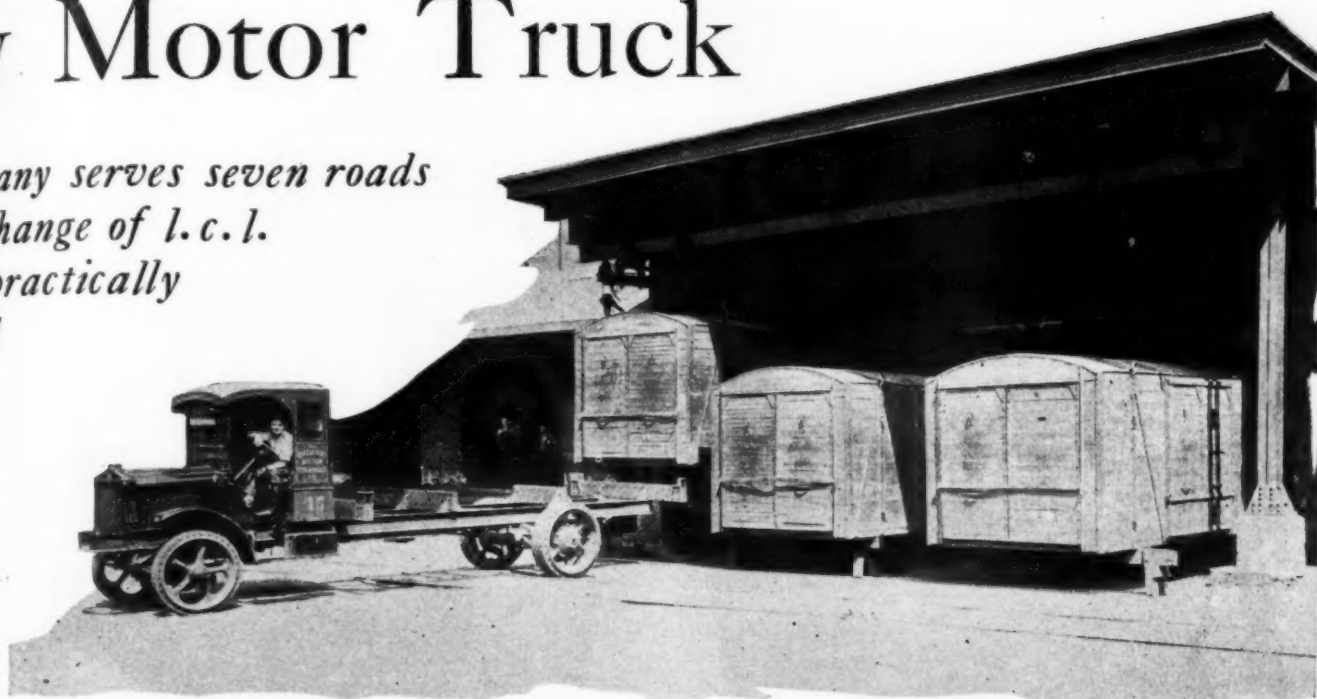


*Freight is Loaded from Containers into Merchandise*



# Motor Truck

Company serves seven roads  
interchange of l.c.l.  
practically  
car  
disc



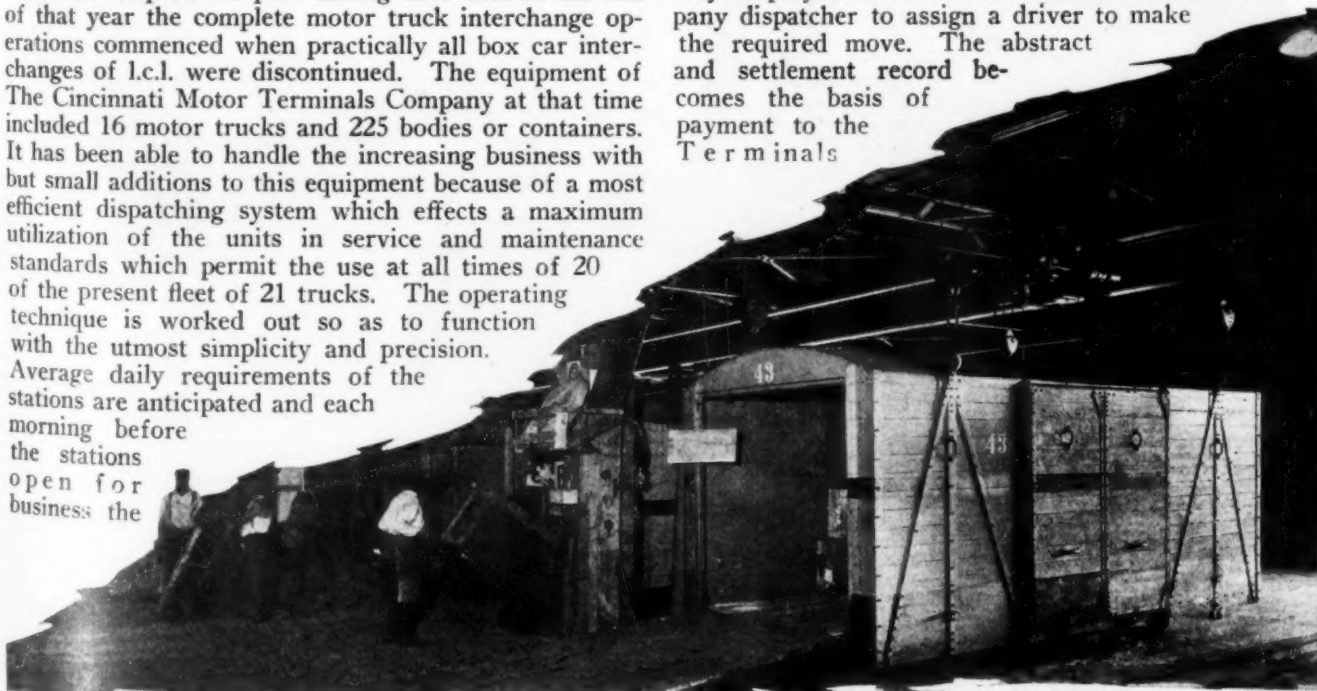
Truck Chassis Receiving Container

handled during 1928, the Terminals Company's motor equipment produced 279,025 truck miles. This total production yielded 183,134 loaded container-miles, 76,632 empty container-miles and 19,259 empty chassis-miles. The foregoing 1928 figure of tons handled compares with a 1927 figure of 225,604 tons, a 1926 figure of 231,051 tons and a 1925 figure of 226,228 tons.

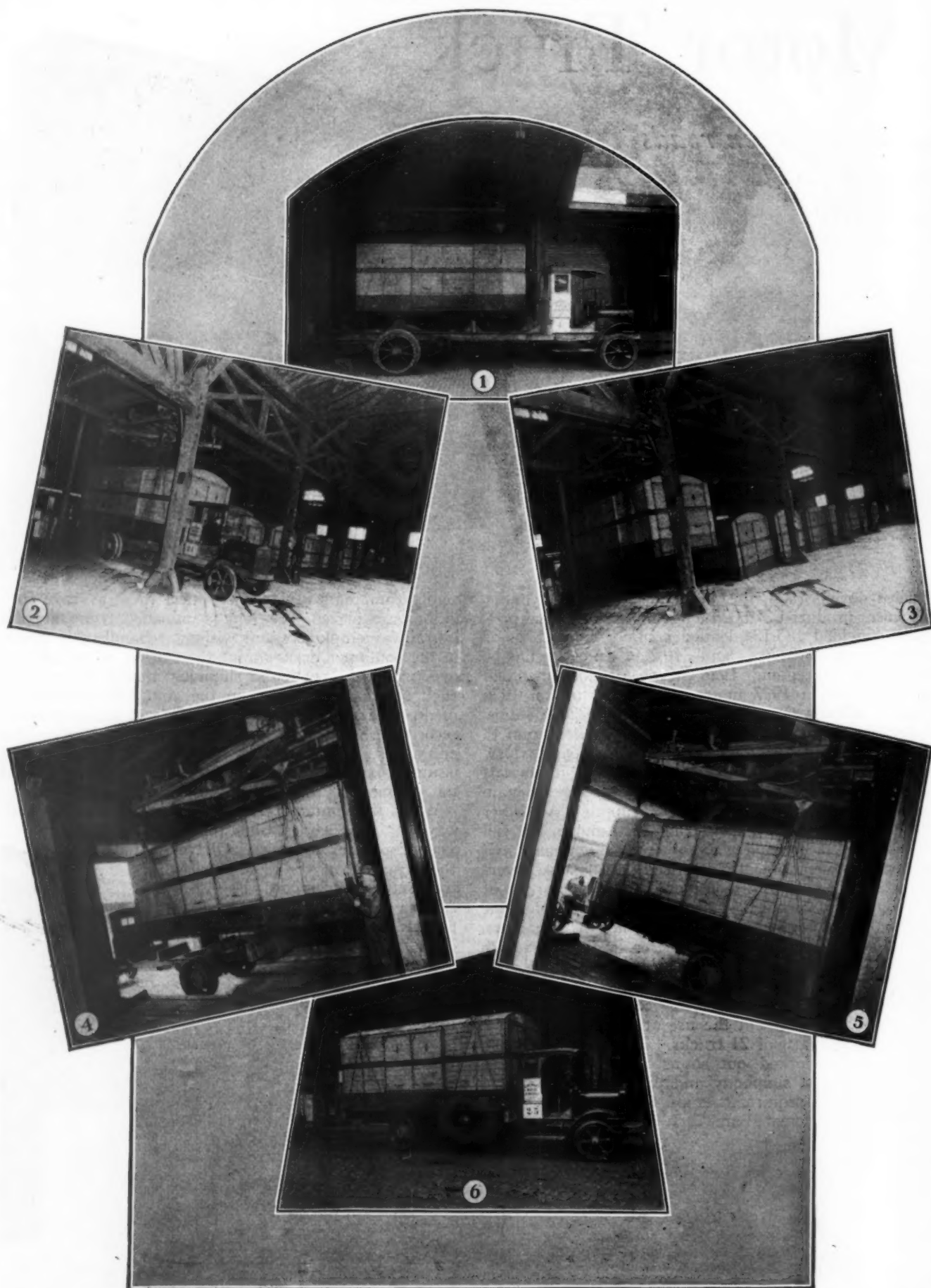
The service was inaugurated in 1917 by Benjamin F. Fitch, president, Motor Terminals Company, New York, when the Big Four employed the Terminals Company to interchange l.c.l. freight among its main and sub-stations in and about Cincinnati. All other railroads adopted the plan during 1919 and in the fall of that year the complete motor truck interchange operations commenced when practically all box car interchanges of l.c.l. were discontinued. The equipment of The Cincinnati Motor Terminals Company at that time included 16 motor trucks and 225 bodies or containers. It has been able to handle the increasing business with but small additions to this equipment because of a most efficient dispatching system which effects a maximum utilization of the units in service and maintenance standards which permit the use at all times of 20 of the present fleet of 21 trucks. The operating technique is worked out so as to function with the utmost simplicity and precision. Average daily requirements of the stations are anticipated and each morning before the stations open for business the

empty containers necessary to meet these average conditions are placed. Freight is unloaded from the cars by railway employees and without rehandling is placed in the container destined for the station of the railway over which the particular shipment is next routed. As each shipment is placed in the container an entry is made on a form which is the abstract and settlement record as shown in an accompanying illustration. This entry lists the waybill date, its number, the name of the issuing road, the origin and destination and weight of the shipment.

When the container is loaded it is sealed by a railway employee who notifies the Terminals Company dispatcher to assign a driver to make the required move. The abstract and settlement record becomes the basis of payment to the Terminals



Cars and Vice Versa Without Intermediate Handling



1. Lowering Container onto Truck  
2. Truck Placed for Unloading  
3. Lowering Container to Floor

4. Placing Truck to Receive Load  
5. Loading Completed  
6. Truck Ready to Move



### Monthly Settlements

The great bulk of the business, however, is in the short haul downtown transfers between the main stations. The longer hauls are movements from the substations of a railroad to its own main station where the freight is consolidated into cars. In the case of one railroad, however, the Terminals Company service is employed to provide an overnight movement between Cincinnati and Chicago. Cars are loaded and unloaded

### Abstract and Settlement Record

TRUCK No. 6 DISPATCHER'S RECORD DATE 3/1/29

### Dispatcher's Record

## The Dispatching System

Since transfers must be arranged to accommodate the railroads it has been found necessary to issue instructions to each driver every time he completes a movement. For this purpose the company telephone system has a line into each of the 25 stations served. Calls are made direct to the dispatcher without the intervening service of an operator. The dispatcher's record form is shown in one of the accompanying illustrations. As may be noted from this illustration the form is ruled in nine vertical columns. The first col-

umn contains the key numbers of the various stations. In other columns are entered the origin and destination of a movement, departure and arrival time and the distance. This entry of distance is divided to show loaded and empty container mileage and empty chassis mileage. In the final column any undue delay, with its cause, is entered. For example, the illustration shows that truck No. 6 moved from the garage to the Big Four Front Street Station between 7:00 and 7:05 a.m. and carried an empty container the half mile. At 7:25 it left this Front Street Station to move a loaded container one mile to the Central Avenue Station of the Big Four, arriving at 7:30. From this latter point the chassis proceeded empty to the Vine Street Station of the Southern from which after a delay of 20 minutes consumed in moving an empty about the station, it proceeded at 8:15 to move a loaded container two miles to the B. & O. Kenyon Avenue Station. In this manner the movements of each truck are directed throughout the day.

The orders for transfer of containers are received from railroads in the dispatcher's office by telephone and are recorded on a separate sheet. This notation consists merely of the key number of the station where the container is ready and that of the destination station. Thus when a driver calls for instructions the dispatcher looks at the sheet listing containers ready to move, instructs the driver accordingly and checks the item on his memorandum sheet to show that the order has been filled.

White trucks with 205-in. wheelbase are used. The Terminals Company takes care of its own maintenance and to insure uninterrupted service the repair shop is operated day and night. Maintenance employees include a day mechanic and helper, a night mechanic, two garage men, an electrician and helper, the latter two for work on the cranes, and a carpenter and helper to care for repairs to the containers.

In addition to the foregoing repair forces, the dispatcher and the 21 drivers, the local organization includes two office employees. The work is directed by C. D. Magness, manager Cincinnati Motor Terminals Company and a former railroad employee. He is assisted by a superintendent who is also a former railroad man.

## Co-ordinating Container Facilities Developed

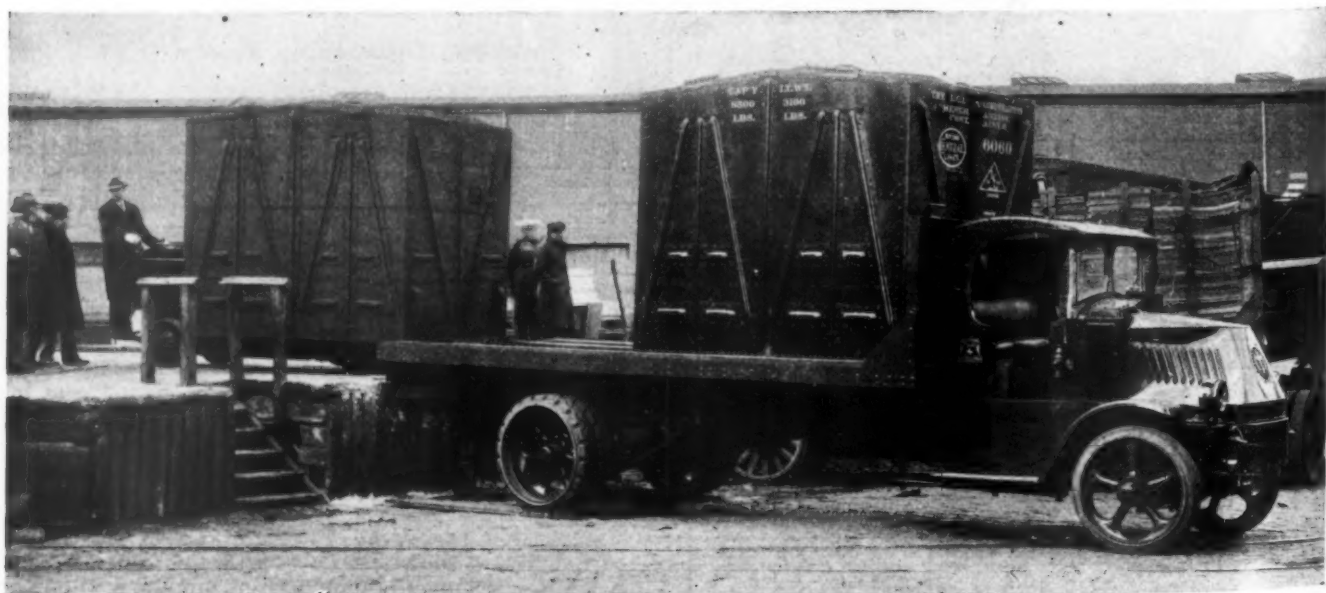
**F**ACILITIES for a wider extension of co-ordinated rail and highway freight service through the use of containers have been developed by A. F. Callison, terminal engineer, New York, with the co-operation of the L. C. L. Corporation, the Elwell-Parker Electric Company and the Mack Truck Company.

In determining these new methods for handling the L. C. L. Corporation's merchandise container the size of the container was taken into consideration and also the vast number of railway stations where crane service is not available for the handling of the containers from railway cars to motor trucks. It was likewise realized that some freight, because of its physical characteristics, is not suitable for loading into containers and thus would have to be transported in box cars.

### Transfer by Lift Truck

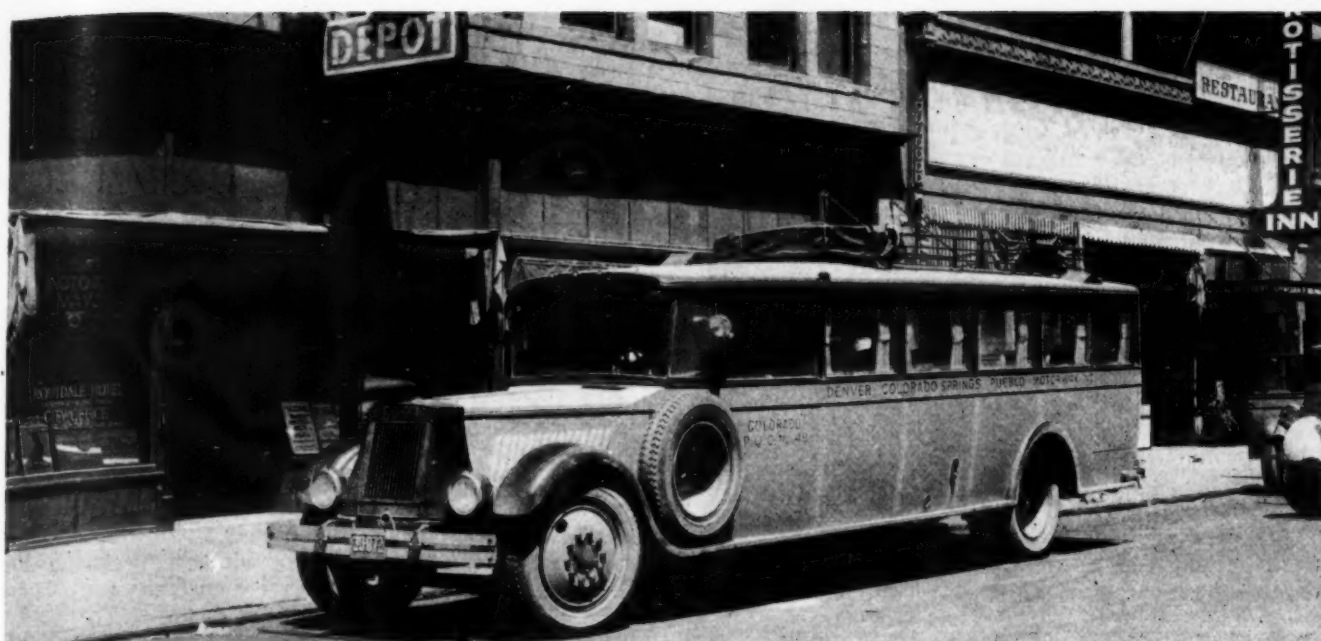
The decision was therefore reached to recommend a lift truck to make transfers of the containers from the cars across platforms and onto motor trucks, the idea being to recommend the operation of a mixed train of box and container cars, loading and unloading both simultaneously at the same platform.

Accordingly the interested parties have developed their respective units for the service. The Elwell-Parker Electric Company has built a lift truck for the shifting of the container from car to motor truck; the Mack Truck Company has put out a truck capable of handling two of the merchandise containers at one time and an automatic leveling device has been developed for attachment to the rear of the motor truck. This latter operates in connection with a step at the station platform and brings the platform of the motor truck on a level with that of the freight house. The step may also be installed at the business places of railway patrons and it is low enough so as not to interfere with any fixed body truck's operation from the same platform. This co-ordinating plan contemplates the use of a drop-side gondola car for the rail movement of containers.



Lift Truck Shifting Container from Platform onto Motor Truck





Denver & Rio Grande Western Motor Coaches Pick Up Passengers at a Union Coach Station in Denver, Colo.

## Off-Rail Stations Increase Business

*Survey reveals that most railways use city coach stations as well as rail stations—Also employ commission ticket agents*

THE location and number of an operator's motor coach stations and ticket agencies are generally considered to have a marked effect upon the amount of business secured. This is notably true in competitive territory. In order to determine the practices of the railway motor coach operating companies with respect to such off-rail stations and ticket agencies, a questionnaire was addressed to the officers of some of the principal railway motor coach companies. The questions asked were as follows:

(1) Do your motor coaches discharge passengers only at your railroad stations, or do they stop only at points more convenient generally to the business centers of the towns on your line, or do they make both kinds of station stops?

(2) What are the reasons for your practice in this respect?

(3) If you utilize off-rail stations, do you own them, or do you make other arrangements for space?

(4) Are tickets for transportation in your motor coaches sold only at railroad stations, or are they sold also at various kinds of motor coach stations, whether union terminals, your own stations, or through ticket agencies?

(5) What is the basis of compensation of special ticket agents?

(6) Can you give any concrete example of business increases which have resulted from the establishment of off-rail coach stations, or from the employment of special ticket agents?

### Off-Rail Stations Generally Used

From the returns to this questionnaire, it appears that railroad motor coaches in general stop at both rail-

way and special motor coach stations, unless they are prohibited from stopping at the latter because of restrictions in their operating certificates, some roads having been granted permission to operate motor coaches only in direct substitution for steam trains. Of the companies represented in the replies to the questionnaire, only the Northland Transportation Company, subsidiary of the Great Northern, follows the practice of making no stops at the railway stations. The railway motor coaches stop at the railway stations not only because some of them are compelled to do so under their operating certificates, but also because, by this means, the co-ordination of railway and highway service is carried out. Stops are made in the business centers of the towns served because of the greater convenience to most patrons.

In only a few instances do the motor coach companies own the off-rail stations. The preference is to rent space for such stations on the ground floor of centrally located buildings, or to make arrangements for the use of facilities of union motor coach terminals. Tickets for transportation in the railway motor coaches are generally sold not only at railway stations, but also by agents in charge of off-rail stations and by special ticket agents of various kinds. Tickets for transportation in the Northland motor coaches, however, are not sold at Great Northern railway stations. The special ticket agents are compensated on a commission basis, ranging from three to five per cent of their total sales. Five per cent seems to be the most common basis, although one company, the New England Transportation Company, pays as low as 3 per cent commissions in some cases, and as high as 10 per cent commissions in other special instances.

The officers replying to the questionnaire expressed the general belief that off-rail stations and the employment of commission ticket agents do have the effect of increasing the business attracted to their motor coaches. Although concrete examples cannot be given, many such cases were reported, particularly from hotels.

The following officers replied to the questionnaire: R. W. Budd, manager of operations, Northland Transportation Company; Warren A. Taussig, general superintendent, Southwestern Transportation Company; P. J. Neff, vice-president and general manager, Missouri Pacific Transportation Company; M. F. Steinberger, manager highway transportation, Baltimore & Ohio; A. C. Tosh, superintendent Reading Transportation Company; and H. Price, traffic manager, New England Transportation Company.

#### Northland Transportation Company

The Northland Transportation Company, according to Mr. Budd, follows the practice of stopping its motor coaches only at points most convenient to the business

only stop made is at the railroad station, while in the larger cities, the motor coaches usually stop at all hotels. The use of railway stations is emphasized because of their prior existence, and the convenience that such stops afford to patrons in the making of train connections.

The Southwestern rents the space used for its off-rail stations. Tickets are sold at such motor coach stations, as well as at the railway stations, and the ticket agents are paid a percentage of their ticket sales.

#### Missouri Pacific Transportation Company

The Missouri Pacific motor coaches, says Mr. Neff, make stops at both railway and off-rail stations. In some cases, the railroad stations are not located near the centers of population, making it desirable to provide additional station facilities or to make stops to let off or pick up passengers at points other than the railroad stations. The Missouri Pacific has found that in many cases, where passengers can be brought directly to the shopping districts, they will leave their own cars at home



Most Railway Motor Coaches Stop at the Railway Stations, Like This One on the Boston & Maine

centers of the towns which it serves. He states that the flexibility of motor coach operations makes it necessary to do this, and that ordinarily the railway stations are inconvenient to the business centers of the towns in which they are located. The Northland owns as few stations as possible, renting space where it must, or else installing commission stations.

Its tickets are sold at union motor coach terminals, at its own stations and by special ticket agents. The compensation of commission ticket agents throughout the Northland system is generally five per cent of total sales, although in some cases, the rate of commission is somewhat less, varying with the volume of business done.

#### Southwestern Transportation Company

According to Mr. Taussig, the Southwestern Transportation Company's motor coaches stop both at railway stations and at points more convenient to the business centers. In smaller communities, as a general rule, the

and patronize the motor coaches. The picking up and delivering of passengers in the business centers is also considered a convenience to traveling men in many instances.

No off-rail stations are owned by the Missouri Pacific Transportation Company, all such facilities being leased. Tickets are sold at railroad stations, motor coach stations, hotels, and other places where ticket agencies seem desirable. Special ticket agents are allowed a 5 per cent commission on the tickets sold.

#### Baltimore & Ohio

The Baltimore & Ohio, through its subsidiary, the West Virginia Transportation Company, is now operating an extensive system of motor coach lines in West Virginia. Its motor coaches, according to Mr. Steinberger, pick up and discharge passengers at all railroad stations, and in addition stop at designated points in the communities through which they run. These additional stopping places are usually joint motor coach sta-



tions or the stations of traction lines. Service is provided to and from the railway stations in order that the passengers may transfer conveniently to and from Baltimore & Ohio trains. Stops in the business centers of the towns are made because of the desire on the part of many patrons for places more convenient than the railway stations at which they may board or leave the motor coaches.

In one instance, the Baltimore & Ohio maintains its own off-rail station, for which space is rented. In other instances, it has working arrangements with the owners of stations of other motor coach lines. Tickets are sold only at the Baltimore & Ohio railroad stations or at the stations which are under its control. No arrangements have been made for the sale of tickets through special ticket agents.

#### Reading Transportation Company

The Reading company motor coaches stop at all the railway stations, and in some cases make stops at additional points. On some of its lines, according to Mr. Tosh, the existence of competing highway carriers has resulted in the Reading motor coaches being restricted to stops only at railway stations or at contiguous highway points. This practice applies only in those cases where the motor coach service is in direct substitution for train service. On other lines which were taken over by the purchase of independent motor coach companies, the Reading did not change the practice of the former owners of stopping at street intersections as well as at the railroad stations along the route.

The Reading does not employ off-rail ticket agents. All of its tickets are sold by ticket agents in the employ of the railroad and on the railroad payroll, or by the motor coach operators.

#### New England Transportation Company

The practice of the New England Transportation Company with respect to stations and ticket agencies is described in detail in the statement of Mr. Price. On account of the magnitude of the operations of this company, the statement is reproduced below:

Local stops on our routes are determined in part by restrictions which may appear in our certificates, which on certain routes require us to limit local stops to the railroad stations directly involved or to street locations which are equivalent to



Interior of B. & M.-New England Coach Station in Center of Boston Shopping District

the rail stations not readily reached by the highway. Our experience has developed the desirability, if not the necessity, of making local stops, whether they be at agencies or on signal, which will serve the convenience of our patrons and thus make the service more attractive. Thus, on the majority of our routes, local stops are made, not only at stores which have been designated as agency points, but at almost any point, within reason, upon signal of a passenger.

In many instances, railroad stations are remotely located with respect to the centers which they are intended to serve. It being patent that the public will be better served if stops are conveniently located, it has been our practice to designate some centrally located store as the advertised stopping point, rather than a railroad station, which is somewhat removed from our route, although in many cases stops are made both in the center of the city or town and at the railroad station.

In the larger cities, there is but one stopping point, in a particularly heavy traffic center, which is the property of our company. All other stations, or stopping points, are at local stores and in the majority of cases at drug stores, it having been our view that the latter class of store more readily lends itself to the agency requirements of a transportation company. It should be understood that these local stations, so-called, are not rented, and in many cases no compensation whatever is made for the incidental services which the proprietors of the stores render our company, it having been felt, and I believe concurred in by many of the proprietors, that there was a definite value, in addition to the advertising, in our recognition of their facilities as the local stopping points.

The major portion of our traffic is between intrastate points. Furthermore, our basic rate structure is identical with that which obtains on the lines of our parent company, the New Haven railroad. In consequence, it has been possible to work out a plan whereby local fare tickets of New Haven railroad issue are honored on our motor coaches; but motor coach tickets are never honored on the railroad trains. While many of the railroad stations sell motor coach tickets, the sales of this class of tickets are largely confined to interstate traffic, to points which previously were not served by railroad trains, as well as to points where all railroad service has been discontinued as a result of the establishment of motor coach lines.

Motor coach tickets are sold also at numerous stores along our routes, these arrangements having been made not only to stimulate travel but to speed up our operation through the elimination of delays incident to cash fare collections, and furthermore to minimize revenue difficulties which might be encountered if large sums of money were handled by our numerous employees. We maintain our own, or participate in, distinct motor coach terminals at practically all of the larger centers, such as Boston, Providence, Worcester, Springfield, New York, etc., which facilities are entirely separate from those of the railroad company and are centrally located. Some are union coach terminals; others are used almost exclusively by our own company in conjunction with other motor coach companies which are subsidiaries of railroads. In metropolitan areas, arrangements have likewise been made with practically all of the recognized tourist agencies, at which motor coach tickets are sold, but this arrangement is confined to competitive routes.



Interior of Unique Santa Fe Off-Rail Motor Coach Station at Santa Fe, N. M.

The subject of compensation to ticket agencies is a rather broad one. It is governed not only by competitive conditions but by local situations as well. No uniform basis has been fixed, in view of these conditions. In the majority of cases, the local agencies on either non-competitive or partly competitive routes receive their compensation through a 3 per cent commission on gross sales; in other instances, it has been found necessary or expedient to pay a 5 per cent commission; while in the metropolitan areas, largely due to the practices which have been in effect for many years, both in connection with steamboat lines and motor coach lines, it has been found necessary to offer a 10 per cent commission. Generally speaking, the compensation which an agency receives is on a commission basis.

It is somewhat difficult to place a finger on the number of passengers who use our service as against a competitive line because of the payment of commissions or other compensation. Tourist offices, however, exist solely on the commissions which they receive or the service charges which they assess, and it is patent that the business which they control will be routed by that company which makes possible the greatest margin of profit to the tourist agency. The same condition is true at certain of the local stores along motor coach routes, some of which stores, by reason of recognition given them by coach companies, and because of their excellent locations which tend to control traffic, are fast approaching the tourist office business. While I have stated that concrete examples are difficult to produce, there is hardly any question that, because of the various circumstances, the engagement of outside agencies is in the interest of an operating company, at least at the present time.

## Sleeper Motor Coaches

**T**HE Great Lakes Stages, Inc., operating from Chicago through Cleveland to New York, has placed in service two sleeping motor coaches, the bodies of which were designed and constructed by the Bender Body Company, Cleveland, Ohio, and the chassis by the C. H. Will Motor Corporation, Minneapolis, Minn. The arrangement of the coach interior is of particular interest, the design including many features for the comfort of the passengers.

One of the problems involved in a motor coach of this type is that of proper ventilation. This has been solved by the installation of a newly designed No-Draft forced ventilating system, which completely renews the air inside of the coach every four minutes. It is claimed that this is the first time that proper ventilation, without draft, has been successfully accomplished in a sleeping coach.

The upper and lower berths are furnished with double outside windows fitted with non-shatterable glass and also screens for summer. The berths, which are ar-

ranged similar to those in a Pullman sleeping car, are furnished with thick, soft spring mattresses. Attached to the side of the lower berths on one side of the coach are collapsible folding seats, which are used by the passengers while the berths are being made up. In the day time, the removable berth partitions permit the car to be made into a chair car. Removable service tables are available for each berth section. Each coach is fur-



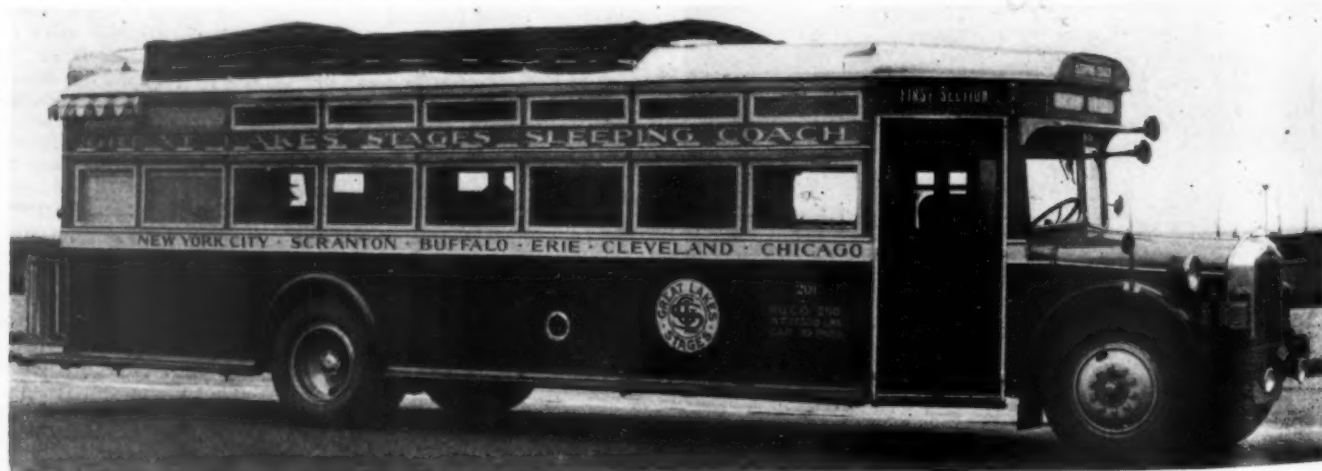
Interior of Coach Showing Arrangement of the Berths

nished with linen service for six complete changes of all berths.

Wash rooms are provided in the rear of the coach with all toilet facilities, including running hot and cold water. A smoking lounge with four seats is also provided in the rear. The driver's compartment contains an extra seat for the relief driver and a porter.

The coach weighs 17,500 lb. and has a capacity for 30 passengers. On one side of the car the berths are double width and on the other, single.

THE GREYHOUND LINES. Independent trans-continental motor coach operator, has announced the establishment of a school for the training of its drivers. Candidates will be selected by the various division superintendents and, upon passing a physical examination, their training course will begin. The course as outlined contemplates that the student will receive instruction in the maintenance, traffic, operating, insurance, claim and safety aspects of the business.



Sleeping Coach Which Has a Capacity for 30 Passengers





*The Men Who Worked on Coach 514 Enjoying a Ten-Minute Smoking Period.*

## N.E.T. Completely Overhauls Motor Coach in 7 Hrs. 40 Min.

*Rebuilding in 63¼ man hours made possible by unit replacement system and co-ordinating efforts of workers*

THE New England Transportation Company, the motor coach subsidiary of the New York, New Haven & Hartford, at its Providence garage on March 27, demonstrated the great possibility of the employment of the parts replacement system of repairs by completely overhauling a motor coach in 63 hr. and 16 min. of pay-roll time, or in an elapsed time of seven hours and forty minutes. Although it was generally agreed among the many steam railway and motor carrier officers who witnessed the demonstration that this record would stand for some time, D. V. Gearwar, mechanical superintendent of the company, indicated that the ultimate goal has not yet been reached.

Before going into the details of how a motor coach was overhauled in less than eight hours, it is well to describe somewhat the preliminary planning and studies that have been made during the past year with the objective in mind of overhauling practically all of the motor coaches operated by this company by the unit replacement repair plan.

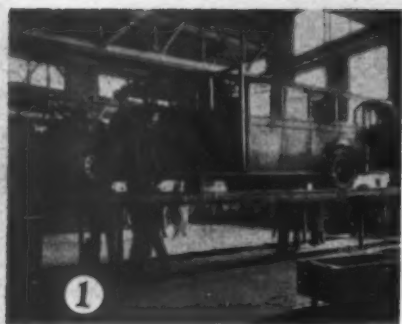
### Preliminary Studies

Before developing this system, a study was made of the number of each individual part used from stock on the various makes of motor coaches during one year and the elapsed mileage between replacements. In addition, each individual failure and delay for the same period was analyzed to determine the cause. All shop work cards were studied. Frictional parts were micro-

metered at various stages to determine the amount of wear.

With this wealth of information, it was comparatively easy to determine the different strengths and weaknesses in parts and accessories of coaches of different manufacturers and from this data the repair system was developed, using a different basis for each make of coach and providing a safety factor in every case.

A servicing and unit-replacement pyramided maintenance schedule was prepared for each type of coach. The service manual, which covers the Pierce-Arrow coaches and includes nine schedules, is reproduced in Table I. The schedules pertain to every Pierce-Arrow coach housed at points where service or running repairs are handled by N. E. T. Company employees and are faithfully followed before the coach is released for further service. The work called for in the first eight schedules is done at the housing points. When a coach is due for Schedule 9, it is routed in revenue service to the Providence shop. An examination of the schedules indicate that their compilation has been based on painstaking study of frictional wear, mechanical failures, etc., with the result that if the schedules are followed, mechanical failures will be reduced to a minimum. That mechanical failures have been reduced to a minimum is indicated by the fact that the mechanical delays average less than four-tenth of one per cent of operated schedules, an average that has been maintained consistently over the past 18 months.



1—Start of the Overhaul at 8 A.M.

2—Lowering the Rebuilt Engine in Place.

3—Front Axle Assembly Ready to Be Connected Up.



4—Connecting Up the Drive Shaft After the Coach Has Been Placed on the Hoist.



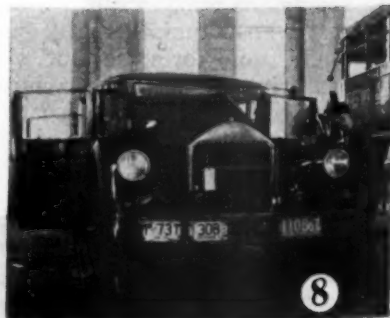
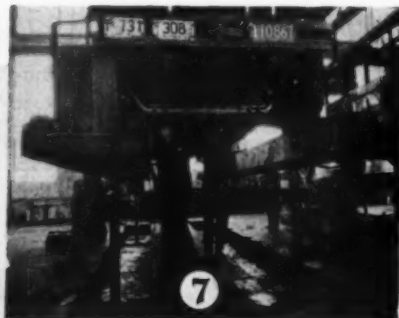
5—Finishing the Application of the Rear Axle Assembly.

6—Method of Handling the Transmission Unit.

7—The Underneath Work is About Completed.



8—Repairing a Broken Feed Line. A worker is working on a large machine."/&gt;





On certain coaches, irrespective of the operating condition, generators, starters, distributors, brake diaphragms, air valves, compressors, etc., are removed at a stipulated mileage and replaced with rebuilt, tested units, and those removed are forwarded in specially built containers to base garages for rebuilding and testing. The same holds true on brake relining and build-

Table I—Servicing and Replacement Schedules for Pierce-Arrow Coaches

ITEM No.	WORK TO BE DONE
<b>SCHEDULE No. 1—DAILY</b>	
1	Check wheel studs and nuts together with tire pressure
2	Check radiator for water
3	Make visual inspection for oil and water leaks
4	Check fan belt for wear and tension
5	Check oil levels and refill where necessary
6	Check for gasoline pressure leaks at carburetor and vacuum and storage tanks
7	Start engine and observe any unusual noise, pings or knocks and observe acceleration
8	Check oil pressure gage
9	Check ammeter
10	Check windshield cleaner
11	Check all running and illumination lights



Front Axle Assembly with Springs in Position



Rear Axle Includes the Springs and Brackets

#### Replacement Units Ready for Coach 514

- 12 Inflate air springs if necessary. If flat repeatedly, remove and substitute service spring
- 13 When starting motor, check both sides of ignition as well as duals
- 14 Make hydrometer battery test. (Must have minimum of 1,200, otherwise replace)
- 15 Check speedometers for operating condition
- SCHEDULE No. 2—1,250 MILES**
- 1 Complete Schedule No. 1
- 2 Completely grease all fittings, using specification grades of grease in designated locations
- 3 Oil generator, fan and starting-motor bearings
- 4 Replenish oil in automatic spring-oiler reservoir
- 5 Examine and clean gasoline strainers and filters, if any
- 6 Check fan bolts
- 7 Check composition disc-drive couplings
- 8 Check spark-plug gaps and clean
- 9 Check condition of points and gaps on distributor
- 10 Lubricate air bottles
- SCHEDULE No. 3—2,000 MILES**
- 1 Complete Schedule No. 1
- 2 Change crank case oil
- 3 Check condition of coil resistance and tighten connections, if necessary
- SCHEDULE No. 4—2,500 MILES**
- 1 Complete Schedule Nos. 1 and 2
- 2 Check all gaskets and castings for water and oil and grease leaks
- 3 Check propeller shaft bearings and universals for side play and wear. Check mid-ship bearings and universals for grease. Examine grease retainers
- 4 Check all bolts and nuts on flanges and mid-ship bearings
- 5 Check wheel-bearing adjustment and front-wheel alignment
- 6 Check steering-wheel play
- 7 Check end play in steering knuckles
- 8 Check drums and hubs for grease leakages and overheating
- 9 Examine foot-brake linings
- 10 Test braking ability with Cowdrey instrument. Foot to make 35 ft. at 20 m.p.h. Emergency to make 45 ft. at 20 m.p.h. (If emergency fails to make distance, remove rear wheels and wash or reline if necessary)
- 11 Test for equalization of brakes
- 12 Check heating line for loose bolts, hanger, leaks or blown mufflers
- 13 Check springs for condition of leaves and loose clips
- 14 Check headlight focus
- 15 Draw off and flush radiator and refill (between March 15 and Dec. 15)
- 16 Check all body bolts
- SCHEDULE No. 5—5,000 MILES**
- 1 Complete Schedules Nos. 1, 2 and 4
- 2 Remove valve covers and inspect valve springs and keepers, together with push rods and guides. Crank engine and test compression on each cylinder. Check tappet clearances. Tighten motor legs and support bolts
- 3 Remove band cover on generator and examine and clean commutator and brushes
- 4 Check starting-motor bolts. Inspect starter button-lever travel

- |          |   |
|----------|---|
| ITEM No. | WORK TO BE DONE   |
|          | to insure full travel, precluding partial meshing with ring gear and arcing                         |
| 5        | Remove band cover on starting motor and examine and clean commutator and brushes                    |
|          | <b>SCHEDULE No. 6—10,000 MILES</b>  |
| 1        | Complete Schedules Nos. 1, 2, 3, 4 and 5  |
| 2        | Remove carbon and grind valves  |
| 3        | Check head and block in so far as possible for cracks   |
| 4        | Replace warped, burnt or worn valves  |
| 5        | Disconnect gas line from storage and carburetor and blow out gas line                               |
| 6        | Trace out gasoline line for kinks and dents in line and leakages                                    |
| 7        | Remove wheels and clean shafts and bearings and repack with fresh lubricant                         |
|          | <b>SCHEDULE No. 7—20,000 MILES</b>  |
| 1        | Complete previous six schedules   |
| 2        | Remove and clean out bottom crankcase, clean strainers and blow out oil lines, cleaning throws      |
| 3        | Check retainer on crank shaft at rear of case   |
| 4        | Examine crank shaft bearings and fit  |
| 5        | Check oil-pump drive gears  |
| 6        | Check block for scores  |
| 7        | Install two new plain rings and one Simplex ring, remove carbon from ring grooves                   |
| 8        | Check piston pins for wear and fit  |
| 9        | Check connecting-rods alignment   |
| 10       | Remove and inspect fan-bearing surfaces   |
| 11       | Clean carburetor fuel screen and check float needle and seat for signs of wear. Check float level   |
| 12       | Remove generator and starting motor, substituting service equipment with new couplings on generator |
| 13       | Remove and rebuild carburetor, substituting service equipment                                       |

- SCHEDULE No. 8—40,000 MILES**
- 1 Complete previous seven schedules
- 2 At time of refitting pistons with rings, substitute two oil rings and one new plain ring
- SCHEDULE No. 9—60,000 MILES**
- The coach is brought to the Providence shops for general body rehabilitation and reboring, regrinding and fitting of motor, together with clutch, transmission and rear-end service equipment substitution.

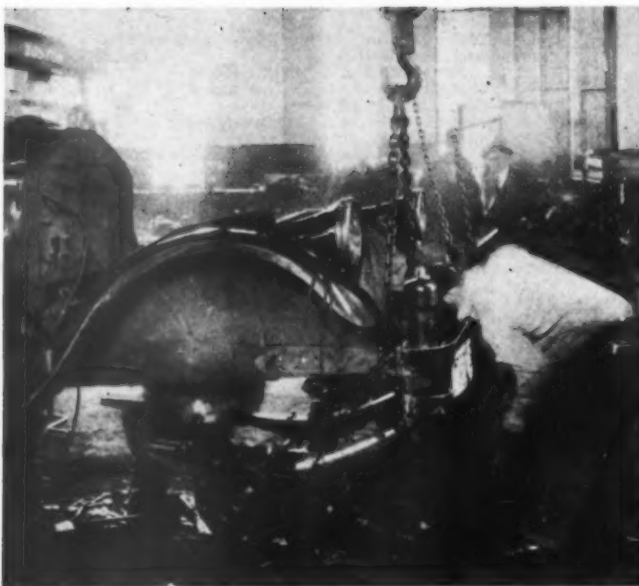
ing up toes on brake shoes, valve grinding, main-and connecting-rod bearing checks, oil ring installations, etc.

#### Method of Controlling the System

All garages report daily the odometer readings of each coach to the headquarters of the mechanical department, where a centralized control of all coaches on the system is maintained. As the odometer readings are recorded, the maintenance schedule numbers coming due are noted and the various garages are advised 700 miles in advance of their becoming due. When a unit becomes due to receive the attention called for under each schedule, the garage foreman is held responsible for the performance of the work. When reporting that the work has been completed, he also reports the odometer reading.

Each garage has a stipulated number of units assigned to its care. The main office compiles charts and statistics each month, furnishing each garage its performance or miles per road delay or failure, together with other statistics, which places the garages on a competitive basis.

In case any accessory or frictional part fails before its pre-determined replacement comes due, it is possible under this system to trace, without error, the individual who built up the unit in question or made the adjustment under the schedule.



Getting Ready To Connect Up the Front Axle Unit

### Overhauling the Pierce-Arrow Coach

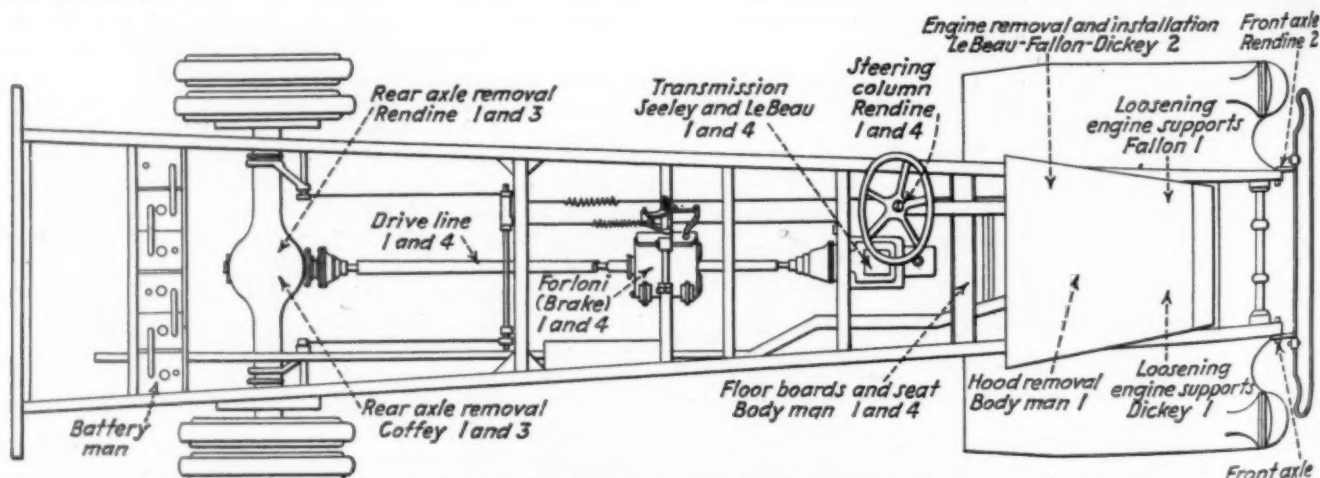
With the above information as a background, we can now proceed to the overhauling of Pierce-Arrow coach No. 514, according to schedule No. 9. The coach arrived at the garage at 7:55 on the morning of March 27, after completion of its regular run from Boston. A total of 67,800 miles appeared on the odometer since

Table II—Schedule Completed on Coach 514,  
March 27, 1929

Item of work	Time	
	Hrs.	Min.
Coach on hoist	8	07
Spares off	8	08
Hood off	8	10
Water and oil drained	8	12
Batteries out	8	16
Steering wheel off	8	26
Rear drive shaft out	8	26
Brake assembly out	8	32
Front drive shaft out	8	38
Steering assembly out	8	51
Batteries installed, O.K.	8	55
Transmission out	9	11
Coach under crane	9	15
Motor out	9	32
Front wheels off	9	35
Front axle out	9	36
Ten minute smoking period	10	00
Front axle installed	10	10
New motor in place	10	26

Item of work	Time	
	Hrs.	Min.
Front wheels installed	10	27
Coach to left side	10	27
Rear wheels off	10	49
Electrical work completed	10	49
Rear axle out	10	51
Rear axle (new) in place	10	52
Radiator installed	11	25
Rear wheels installed	11	30
Motor installation complete	11	45
Rear axle O.K.	12	05
Coach on hoist	12	07
Thirty minutes for lunch		
Steering assembly complete	12	55
Front drive shaft in place	1	05
Transmission in place	1	07
Air bottles and bumper	1	09
Front drive shaft in place	1	20
Transmission O.K.	1	45
Rear axle complete, O.K.	1	50
Front axle complete, O.K.	1	56
Rear drive shaft in place	2	37
Front drive shaft, O.K.	2	58
Clutch, brake pedals and rods, emergency brake lever and transmission housing O.K.	3	00
Ten minute smoking period	3	00
Rear drive shaft, O.K.	3	10
Rear springs, O.K.	3	37
Mechanical work complete	3	40
Greased complete	3	47
Motor started	3	48
Down from hoist	3	51
Body work completed	3	54
Spares installed	3	56
Hood installed	3	56
Repairs to feed line, O.K.	4	23
Out on test run	4	24
Coach out of terminal on schedule run	4	30
Body work:		
Complete window rechanneling, seat, cushion and curtain repairs, etc.		
Electrical work:		
Check batteries, wiring, lights, instruments, etc.		
Body and electrical work continuous until completed.		
Total working time	7 hr.	40 min.

the last previous overhaul. The coach was placed on the hoist at 8 a. m. A crew of twelve men started work. Of these, two worked on the engine, two on the transmission, two on the drive line and brake rigging, two on the rear of the coach and four inside of the coach. Of the latter four, two were body men, one an electrician and one removed the railing, floor boards, etc., preparatory to removing the transmission unit. The electrician removed the old batteries and substituted new ones, painted the battery container, inspected all body wiring and dash instruments, renewed all of the high-tension ignition cable and rewired the dash and the dome lights. The body men rechanneled the 12 side windows, inspected and bolted down all of the 29 seats, cleaned and repaired the seat cushions and backs, and removed two inside panels and installed two new window regulators. The window drapes were removed, cleaned, repaired and rehung. All metal hardware and fittings were removed, inspected and replaced.



1-Removal of various units on hoist. 2-Removal and replacement on right side of garage. 3-Removal and replacement on left side of garage at floor level. 4-Installation of drive line and steering column and transmission on hoist, general tightening up. Electrical and body work handled continuously during operations 1, 2, 3 and 4

Plan View of the Chassis Showing the Position of the Workmen During the Progressive Unit-Overhaul Operations on a Pierce-Arrow Coach



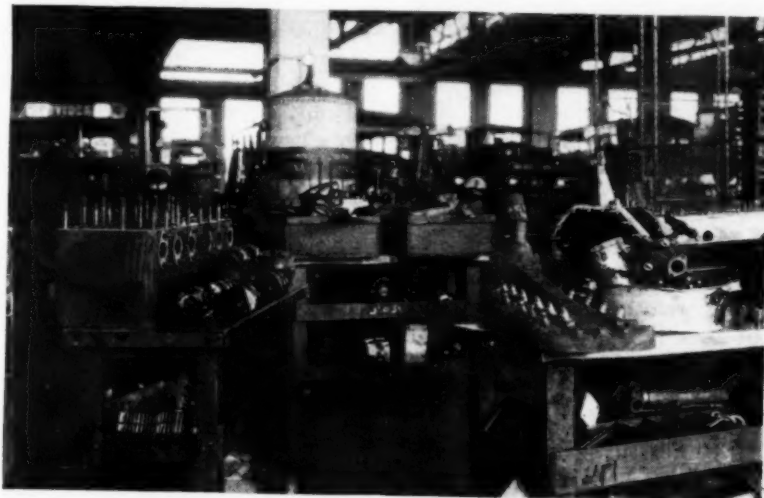
The positions of the men underneath the coach are indicated by the time-study diagrams. The work was divided into four groups, each being progressively designated as operations Nos. 1, 2, 3 and 4.

During operation No. 1, the coach was backed onto a power-driven hoist, located along the left side of the garage. Here, all units designated by Fig. 1 on the diagram, were removed and rebuilt units substituted. These operations completed, the hoist was lowered and the coach pushed forward to the right side of the garage, where the engine and front axle changes were made as indicated by operation No. 2. This shift is made to take advantage of a monorail crane. Replacement of the rear axle is covered by operation No. 3

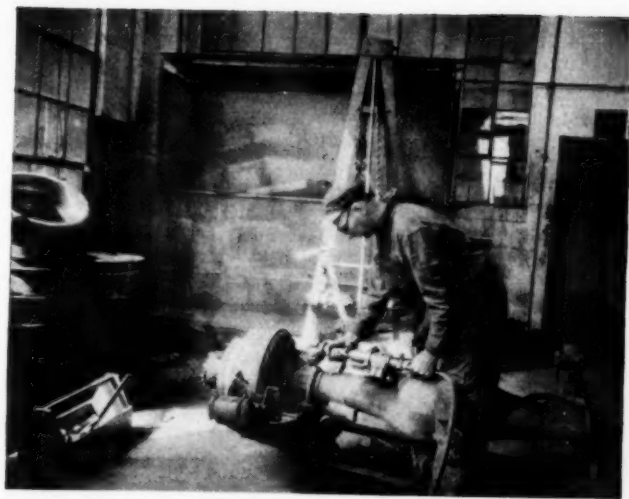
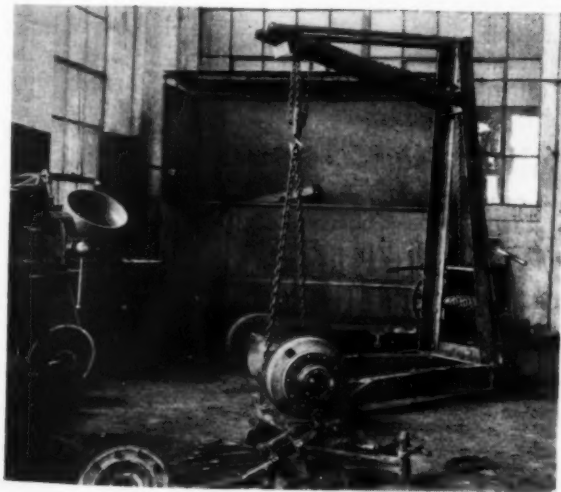
and takes place after the coach has been backed to the left side of the garage. This installation is made from the floor level. Operation No. 4 was performed on the hoist, and includes the installation of the steering gear, transmission, drive line and all other underbody work not mentioned in the diagram. Each of these operations is planned to eliminate interference between the workmen. There was no confusion and as each man completed his task, he went to another job. Consequently, the original crew of 12 men varied as the work progressed.

Complete rebuilt service equipment, power plant, steering column, front axle, spring shackles and brake assembly, together with a transmission, clutch, drive-

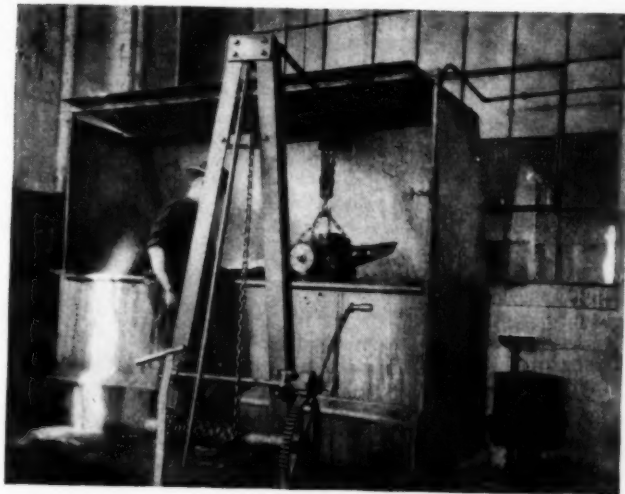
Top—Engine Removed from Coach 514 Completely Disassembled Within Three Hours.



Lower Right—Disassembling the Rear Axle Assembly Using a Close Quarter Air Motor.



Upper Left—The Disassembled Rear Axle Ready for the Cleaning Vat.



Lower View—Placing the Transmission Unit in the Cleaning Vat.

line and differential assembly, which are shown in one of the illustrations, were ready for installation. The rear and front axles have the springs and shackle brackets attached and ready for mounting directly on the chassis. The rear and front axle assemblies, the transmission and engine assemblies, were replaced up to the frame rails. In case of the front axles, the springs are mounted with the shackles and the pins attached, but the spring hangers are rebushed without removing them from the frame. When installed, the engine, which has been run on a test block for 24 hrs., is ready to run as soon as fuel and water are added and the electrical connections are made.

As fast as the parts were removed, they were distributed to the various unit repair departments for rebuilding for the next Pierce-Arrow scheduled for overhauling. In less than three hours after the engine was removed, it was completely dismantled and the cylinder block and crankshaft were scheduled for regrinding. Other parts, such as the axle assemblies and the transmission were taken to the cleaning vat where they were disassembled and cleaned. Thus no time is lost in getting the replacement units ready for the next job.

Table II shows the chronological sequence of the various operations performed on the coach during the overhaul. An analysis of this time study shows how quickly the parts were removed and replaced and also indicates how well each operation is planned so that one does not interfere with the other. The first 2 hr. and 10 min. were required for loosening up all of the parts for their removal. The old engine was out of the chassis in 1 hr. and 32 min., and the installation of the new engine was completed in 3 hr. and 35 min. from the starting time. Seven hours and eight minutes from the time work had been started on the coach, the motor was started, which means that all work underneath the chassis had been completed and that the coach was ready to run under its own power.

The following table shows the labor time chargeable, divided as between engine, chassis, body and miscellaneous:

Operation	Labor time man-hours	
	Hours	Minutes
Engine removal and replacement.....	8	46
Chassis unit installations.....	32	19
Body repairs .....	16	49
Miscellaneous electrical repairs, adjustments, greasing, etc. ....	5	22
Total .....	63	16

The overhaul would have been completed at 3:56 p. m., when the hood was installed, but a fractured gasoline feed-pipe had to be replaced, which caused a 27-min. delay. The final inspection was completed at 4:23 p. m., after which the coach was given a brief test run. The coach left the Providence terminal at 4:30 with 12 passengers on its regularly scheduled trip to Boston.

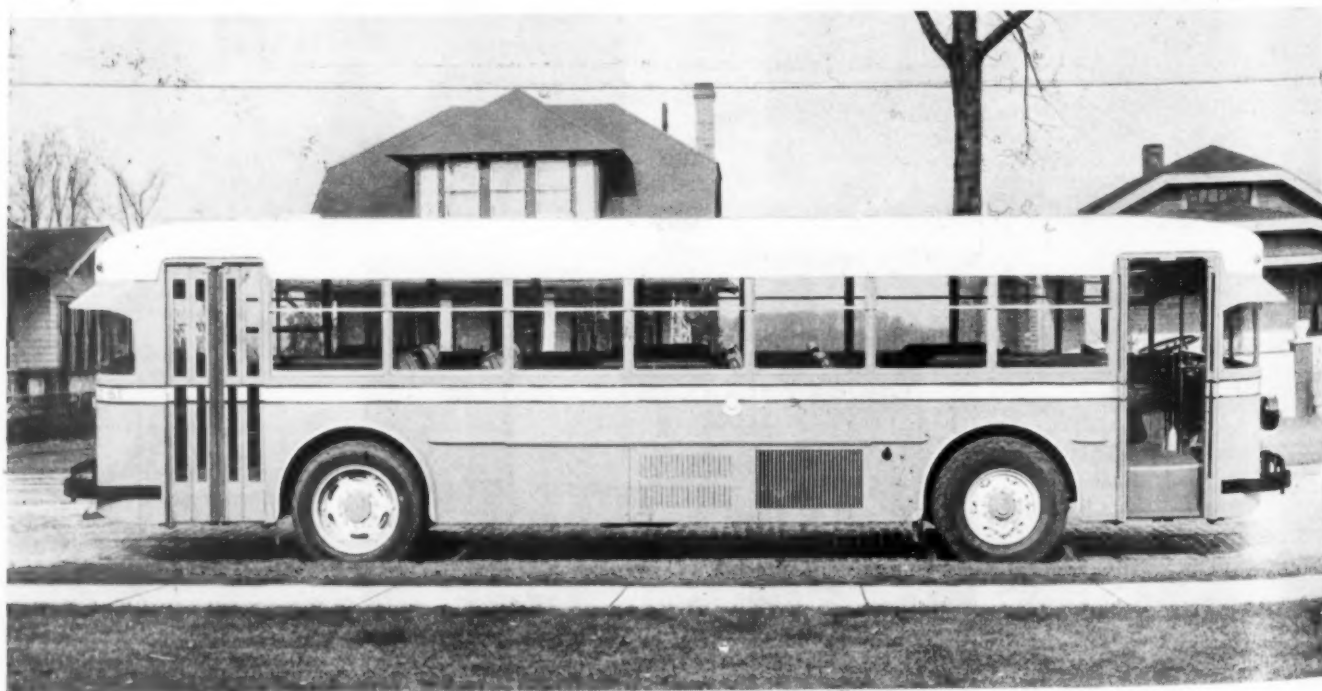
The result of this system, despite the peculiar type of operation, and the housing and garaging of the company's coaches in four states, has contributed to a considerable extent in the performance of 96.97 per cent of on-time service of all of the lines. This is a remarkable performance when it is considered that, excluding its subsidiaries, the company operates 250 coaches with 23,000 or more departures per month, involving in excess of ten million motor-coach miles a year.

#### Interesting Side Lights

In spite of the carefully worked out schedule of operation, unforeseen emergencies occurred which were handled with dispatch without disrupting the schedule. For instance, a frozen shackle bracket could not be removed despite all efforts. The acetylene cutting torch was used to cut the part free. During the cutting, a small fire developed which was promptly quenched by a workman who stood by with a fire extinguisher.

Twice during the day, at 10 a. m. and at 3 p. m., all work stopped for ten minutes to permit the men to smoke. Company regulations forbid smoking in the garage during working hours. This rule applies from the highest officer down. To offset any tendency to break this rule, ten-minute smoking periods are granted to the men. This concession on the part of the company has tended to improve the morale of the employees and produces closer attention to the work.

\* \* \*



Twin Coach Urban Model



# This Transportation Business

*Motor coaches, railways and automobiles are wholesalers, jobbers and retailers of transportation*

By Frank R. Fageol

President, Twin Coach Corporation, Kent, Ohio

**D**ESPITE the frank admission of many of your executive officials that the motor coach and private automobile have stolen a great percentage of your short-haul steam railroad traffic, why has there been such an apparent stagnation in the steam railroad field insofar as the adoption of the motor coach is concerned? Let us try to analyze the reasons for this situation.

If we had looked upon transportation as a commodity years ago, I am not so sure that many of our transportation conflicts would not have been ironed out. In my mind, transportation should not have been looked upon as a general commodity with different brands, like horse, electric and steam transportation, in the same manner as there are Irish potatoes, sweet potatoes and Idaho potatoes.

To furnish consistent transportation, there had to be a road of some kind, and it was the pioneers in the present great railroad organizations who furnished the longest and most effective roads—the original steel railroads. As long as those steel railroads represented the flower of the roadways, our outlets available for this commodity called transportation, everything was fine; but as soon as our present hard surface roadways began to multiply themselves into the millions of miles, the outlets for this commodity called transportation and the demands for the various brands of it became so great that the original powerful transportation group known as the steam railroad group seemed to lose its perspective, seemed to forget that its real purpose and charter should have been to furnish transportation and not merely steam railroad transportation.

Continuing along this line of thought, do you not suppose that things would have been measurably improved for the steam railroad systems had they, back in 1921 or 1922, considered the orthodox system of group merchandising and applied it to transportation?

## Jobbers and Wholesalers of Transportation

The steam railroads, in my opinion, should never forget that in the last analysis, they are really jobbers of transportation. If they keep this thought in mind and the companion thought that the motor coach has now become the wholesaler of transportation, and the private automobile the retailer of transportation, I am sure that the perspective from top to bottom in the steam railroad organization charts would go through a considerable

## Mr. Fageol Says:

The motor coach is definitely robbing the railroad of its former position as wholesaler of transportation. By going into the motor coach business, the steam railroads would simply be establishing branches as the great mercantile concerns do. Every highway vehicle is going somewhere or doing something which will eventually, directly or indirectly, mean business for the railroads. I believe that the railroad companies will continue to be the big wholesalers of transportation. I look to see them control the best and most necessary motor coach routes. This will be a boon to motor coach operation.

of the larger centers, because the coach offers more frequent headway and a more convenient means from the public viewpoint.

With the proper perspective, it seems to me that the jobber and wholesaler, or steam railroad group, should have seen an entirely different frame around the tremendous expansion of highways in the United States and should have looked upon them as so many more retail units capable of supplying still more wholesale business to them. By going into the motor coach business, the wholesale steam railroad set-up would simply have been establishing branches as many other great mercantile concerns have done, for the purpose of feeding to itself as much as possible of the increased business due to the expanded territory and increased human movement, which should logically come to them.

If we eliminate or curtail the highways of this country, we greatly curtail the railroads of this country. Every vehicle which uses the highways, be it horse, private automobile, truck or motor coach, is a direct ally of and a help to the railroad because they are all going somewhere or doing something which eventually, directly or indirectly, means business for the railroad.

Speaking of the great national highway system with its increased thousands of retailers, I ask that the railroad personnel re-canvass its perspective of America's great highway efforts. If this country is to expand its prosperity, the highways must be extended and expanded at perhaps an even greater rate than heretofore.

## Motor Vehicle Paying Its Way

During 1927, highway expenditures increased over \$375,000,000 as against the highway expenditure of 1921, whereas special motor vehicle taxes increased over

\* From an address presented at the open session of the meeting of the Motor Transport Division, A. R. A., in St. Louis, Mo., on March 1

\$390,000,000 in 1927 as against 1921. In my estimation, all reports to the contrary notwithstanding, the motor vehicle is more than meeting the costs of this increasing highway program.

It is rather a surprise to most people, but nevertheless an interesting fact, that of the \$1,465,000,000 spent on highways in 1927, only \$35,500,000 was paid by the railroads, or 2.4 per cent; in other words, less than 10 per cent of the total taxes paid by the railroads are used for highway purposes. In the past, I think that many of the rank and file of the railroads have been prejudiced and prevented from trying to get the proper grasp of motor coach development by their erroneous belief that the common carrier motor vehicle was not paying its way.

#### Railway Control of Motor Coaches Expected

I believe that the railroads, without a doubt, will continue to be the big wholesalers. I look to see them control the best and the most necessary motor coach routes. This will be a boon to motor coach operation. Once the railroads, with their efficient systems of check and maintenance, have taken over many of these hastily organized operations, it will not only be a public benefit, but a benefit also to the motor coach manufacturers.

Perhaps one of the greatest problems of the railroads will be in getting a true message across to the regulatory bodies so that they may fully understand and recognize the economic problems involved, that they may arrange their rules and regulations to allow the railroads to substitute motor coach service for rail service and thus take advantage of the great savings that will result therefrom.

I am looking forward with interest to big developments in motor coach operation through the reported plans of the steam railroads to secure control of, or a substantial interest in, many of the leading independent motor coach companies. With your resources and the benefit of the practical experience of those independent and courageous motor coach pioneers who have learned and built this great business under many handicaps, I predict the American nation will see automotive type of common carrier transportation which will completely dwarf our present conception of such.

## New Heavy-Duty International

A NEW line of heavy-duty International Harvester motor trucks, with respective ratings of  $2\frac{1}{2}$ ,  $3\frac{1}{2}$ , and 5 tons, has recently been developed. The new trucks are being made in both the chain-drive and double-reduction types, with the exception of the 5-ton size which is of chain-drive type only.

Several important new features are incorporated in the design of these new Internationals, some of which are: new and more powerful engines, four-wheel brakes, single dry-plate clutches with vibration dampers, and transmissions with five forward and two reverse speeds.

The engines of the new Internationals consist of five independently maintained sub-assemblies, which simplify servicing and thus help to keep the truck on the job. The entire engine unit of each truck is clean-cut and compact, and all parts are easily accessible, making possible a quick check-over. It has an overhead valve and camshaft arrangement, which is designed so that valve grinding is a simple bench job, and also made so that lubrication is carried to very moving part. Another important feature of the engine is its aluminum pistons, which are of a patented split-skirt type. Six piston rings are used, three of which are compression rings and the other three of which are oil wipers.

Lubrication of the engine is accomplished by means of a gear type oil pump, which forces the oil through a filter, thence into the main oil line where it is distributed to main and connecting-rod bearings by means of drilled holes. It is next conveyed to the cylinder head where it is forced to the camshaft and valve-rocker-arm-shaft bearings, and finally it drains down over the timing gear chain and sprockets. The oiling system completely supplies all moving parts, assuring longer life and added performance to the engine.

The new Internationals are sturdier in construction and are more powerful in appearance. The frame is heavy and numerous cross members are used. The main springs on the double-reduction models are equipped with heavy auxiliary springs of the free-end cantilever type, while the auxiliary springs on the chain-

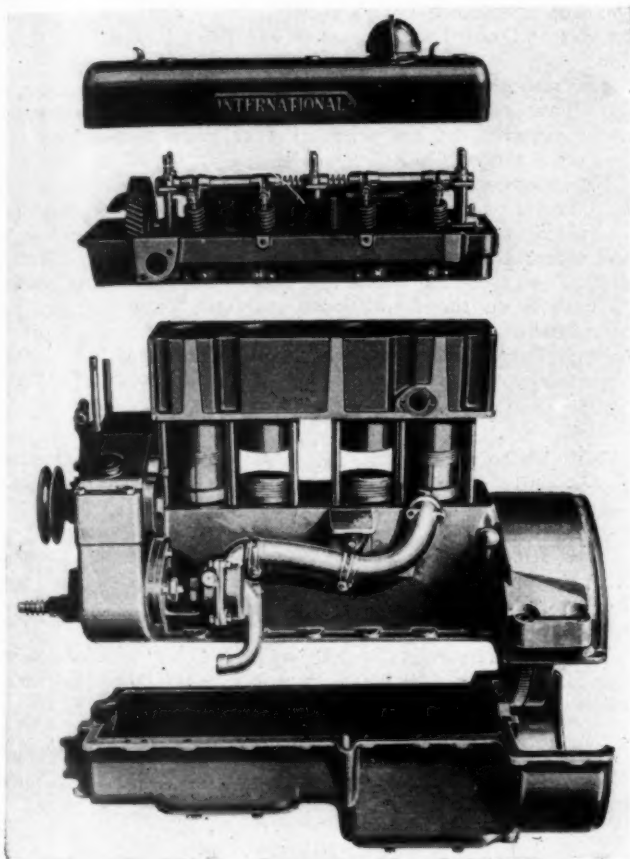


New Heavy-Duty, Double Reduction International Harvester Model HS-54,  $2\frac{1}{2}$ -Ton Truck



drive models are of the semi-elliptic type with free ends. They are of very strong steel and made to stand up under the heaviest kind of hauling. The cab, which is roomy, comfortable, and amply upholstered, is of durable steel to withstand any strain to which it might be subjected.

The steering control on these new trucks is the same patented "Steer-Easy" arrangement which has been

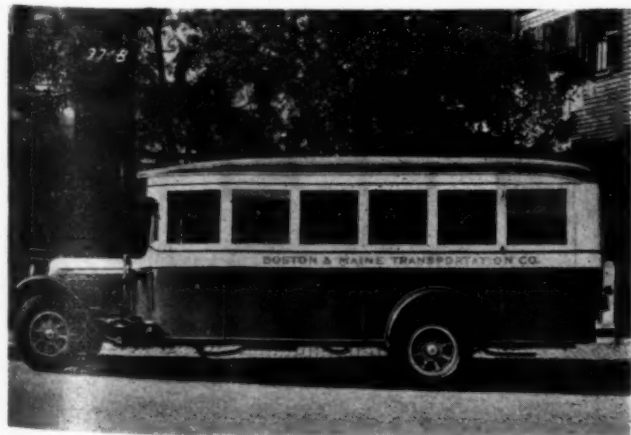


Five Sub-Assemblies in the Engine of the New Models

provided on Internationals for a number of years and which adds to the roominess of the cab.

The trucks are capable of developing an abundance of power and speed—power for the hard pulls and speed for long hauls on the highway. Reductions in low gear are approximately 100 to 1, giving ample power for pulling out of the toughest places.

\* \* \*



Studebaker in Service of Boston & Maine Transportation Company

## Motor Transport News

THE SOUTHERN PACIFIC MOTOR TRANSPORT COMPANY has filed an application with the California Railroad Commission, asking permission to operate motor coaches between Point Reyes, Calif., and Monte Rio.

THE TEXAS RAILROAD COMMISSION, on April 22, considered the application of the Southwestern Transportation Company, subsidiary of the St. Louis Southwestern, for permission to operate motor coaches between Wylie, Tex., and Grapevine.

THE RIO GRANDE MOTOR WAY OF UTAH, INC., subsidiary of the Denver and Rio Grande Western, has begun the operation of motor coaches and motor trucks in replacement of train service between Provo, Utah, and Silver City.

THE SOUTHERN PACIFIC MOTOR TRANSPORT COMPANY has purchased the Southern Oregon Stages, an independent line operating between Klamath Falls, Ore., Ashland and Medford. The operation of this line will be consolidated with that of the Oregon Stages, the largest motor coach operating unit in Oregon, which was recently taken over also by the Southern Pacific. The Pacific stages system has also been taken over by the Motor Transport Company.

TWO COMPLAINTS have been filed with the Public Utilities Commission of Ohio, by the Ohio Association of Commercial Haulers, charging that the Pennsylvania and the New York Central are operating motor transport services without authority from the commission. It is charged that the Pennsylvania operates such services in and between fifteen points in the state of Ohio and that similar operation is carried on by the New York Central in and between ten Ohio cities and towns.

THE TEXAS RAILROAD COMMISSION has denied the application of the Missouri Pacific Transportation Company for permission to operate a motor coach line between Navasota, Tex., and Crockett. In this connection, it is reported that the policy of the commission will be to refuse permits to railways or their subsidiaries for the operation of motor coach lines on routes which are not parallel with the railways, or where applications for the same permits has been filed by individuals or independent interests.

THE SECOND EDITION of the well-known work entitled "The Law Relating to Automobile Insurance," by John Simpson is now published. The first reported automobile insurance case was decided no longer ago than 1907, but the number of decisions cited in this volume is over one thousand. The book has been not only greatly increased in size but thoroughly revised. Compulsory liability insurance and other new features are fully dealt with. The work includes English and Canadian decisions. The indexes are very full and complete. The chapters of most peculiar interest to railroads are those on transportation insurance and on policies and bonds covering service vehicles.

### Great Western of Great Britain Enters New Road-Rail Merger

The Great Western of Great Britain recently announced that it has entered a working agreement with the South Wales Commercial Motors, Ltd., an independent highway operator. This is the second big rail-highway merger to which the Great Western has been a party, the other being in January when the agreement with the National Omnibus Company, operating on the highways in the western part of England, was announced.

The new merger plans are similar to those consummated in the previous case, i.e. a new corporation to be known as the Western Wales Omnibus Company, Ltd., will be formed to take over all highway lines controlled by the South Wales Commercial Motors, Ltd., and all routes now operated in the territory by the Great Western. The new corporation which is authorized to issue approximately \$2,500,000 in capital stock

will be controlled jointly by the Great Western and the former owners of the South Wales Commercial Motors, each electing four directors. Several other working agreements have also been reached with smaller independents in the South Wales area.

### Missouri Pacific Seeks Authority for Additional Lines

The Missouri Pacific Transportation Company has applied to the Missouri Public Service Commission for authority to operate motor coaches between Warrensburg, Mo., and Lee's Summit, a distance of 53 miles. This line would connect with the cross-state line now being operated by the Missouri Pacific between Kansas City and St. Louis. On March 25, the commission held a hearing on the application of the transportation company for permission to operate motor coaches from St. Louis, Mo., to the Missouri-Arkansas state line, where connection would be made with the highway routes of the company now operating in Arkansas.

### New Missouri Pacific Coach Lines

The Missouri Pacific Transportation Company, on April 6, began the operation of motor coaches between Memphis, Tenn. and Wynne, Ark. Two round trips daily are being operated on this line.

On April 2, the Missouri Pacific Transportation Company effected the purchase of the motor coach lines of the Motor Transportation Company, operating between Natchez, Miss. and Monroe, La., Natchez and Tallulah, La., and Natchez and McGehee, Ark. No changes in schedules or rates were made, but it was announced that the equipment operated by the Motor Transportation Company would be replaced with new motor coaches as quickly as delivery of the new equipment could be secured.

### New Design Sleeper Motor Coach in Service in Great Britain

Two new sleeper motor coaches, different in design from those previously used, have been placed in service in England between London and Manchester, according to a recent article published in *Modern Transport* (London).

The vehicles which each make one round trip daily are operated by the Land Liners, Ltd. For day journeys the fare for a one-way trip is about \$3 while a round-trip ticket may be purchased for the equivalent of about \$5.50. Night fares, including a berth and a light breakfast are \$3.75 one way and \$7.20 a round-trip. The third class railway fare in one direction is about \$5.50 or the same charge as is made for the day round-trip in the motor coach.

The new vehicles are double-decked and will carry 44 passengers in day travel and 21 at night. A departure from other designs is the placement of berths transversely instead of lengthwise. Each coach is divided into seven compartments, four with four berths, two with two berths each and one single-berth compartment.

### South African Railways Highway Services

Increased traffic for the highway services of the South African Railways was reported in the annual statement for the year ended March 31, 1928. At the close of the year the route mileage of these highway services had increased to 7,349 or 3,067 more than were in operation at the close of the previous year.

According to the statement 947,573 passengers were carried in the motor coach services during the 1927-28 period, an increase of 453,649 from the 1926-27 figure of 493,924. Freight traffic on the motor truck routes amounted to 62,799 tons during 1927-28 as against 24,891 tons in the previous year. Likewise the amount of cream carried by truck increased from 192,738 gallons during 1926-27 to 390,591 gallons in 1927-28.

Gross revenues rose £107,587 or from £79,885 (\$389,039) to £187,472 (\$912,988). The expenses, however, mounted more rapidly and increased £116,025 from £82,558 (\$402,057) in 1926-27 to £198,583 (\$967,099) in 1927-28. Thus the deficit in the latter year was greater by £8,438 (\$41,093). This is explained by the fact that many highway routes added during

the year did not develop a paying volume of traffic immediately. A total of 240 vehicles were in service on March 31, 1928.

### Road-Rail Service in England a Success

The Great Western of Great Britain in a recent announcement stated that its first coordinated rail and highway service, introduced on October 29, 1928 had met with success. The highway portion of the journey is between Cheltenham and Oxford, a distance of about 40 miles. The motor coaches connect at Oxford with trains to and from Paddington. (London).

The response of patrons has been such that three new stations have recently been added to the route over which the traffic requires the operation of four daily round trips and two on Sundays.

New motor coach equipment was placed in service on March 18. This new equipment is of the latest type and includes: Individual seats, upholstered in leather, with moquette backs and sides; hot water heating apparatus adjustable to different degrees; cigarette, chocolate and match machines; parcel racks; fibre mats on the floor; loose cushions, draw curtains, ash trays and rug rails; double roof with ceiling finished off in brown "Fabrikoid"; and a clock and two mirrors.

### Orders for Equipment

THE MISSOURI PACIFIC TRANSPORTATION COMPANY has accepted delivery on three 29-passenger A.C.F. parlor type motor coaches.

THE RICHMOND, FREDERICKSBURG & POTOMAC has accepted delivery on four A.C.F. motor coach chassis to be equipped with Bender Pullman bodies.

THE SOUTHWESTERN TRANSPORTATION COMPANY has ordered two 22-passenger parlor type motor coaches from the Studebaker Corporation of America.

THE MISSOURI PACIFIC TRANSPORTATION COMPANY has ordered one 22-passenger parlor type motor coach from the Studebaker Corporation of America.

THE SANTA FE TRANSPORTATION COMPANY, Santa Fe, N. M., has accepted delivery of five Type W Yellow coaches of the parlor type, from the General Motors Truck Company.

THE READING TRANSPORTATION COMPANY has purchased 10 Mack Model BK, six-cylinder motor coaches, equipped with special Mack observation car bodies.

THE MISSOURI PACIFIC TRANSPORTATION COMPANY has accepted delivery of five Type W Yellow observation coaches from the General Motors Truck Company.

THE SOUTHWESTERN TRANSPORTATION COMPANY, subsidiary of the St. Louis Southwestern, has accepted delivery of eleven additional Type W motor coaches, from the General Motors Truck Company.

### Among the Manufacturers

The Timken-Detroit Axle Company has moved its New York office from the Graybar building to 9 East Fortieth street.

H. A. Huebotter, former chief engineer of the Butler Manufacturing Company, Indianapolis, Ind., has joined the engineering staff of the Waukesha Motor Company, Waukesha, Wis.

Thomas Blagden, Jr., Australian division manager of the White Company, Cleveland, O., has been promoted to vice-president in charge of the export region. L. M. Hart, managing director of the White Company, Ltd., the Canadian company, has been promoted to vice-president in charge of the Canadian region.